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D O C U M E N T S  B R A N C H

T R A N S L A T I O N

Number 69

6 May 1947

# MILITARY TOPOGRAPHICAL STUDY OF WESTERN BAIKAL

Prepared by

Documents Branch
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# SUMMARY OF CONTENTS

## Military Topographical Study of Western Baikal

(Doc No 256736)

This is a complete translation of a photostatic copy of an original handwritten document approximately 170 pages long which, though undated, was probably written October 1942 or later. It is a compilation based on intelligence reviews for the Kwantung Army and was intended for circulation among higher commands as a basis for military operations.

This detailed topographical study of the Western Baikal area, centering around Buryat-Mongolia ASSR and Irkutsk Oblast, was designed to be of operational value to troops within that region. It includes a short preface, numerous tables, and supplementary maps and charts; and its text thoroughly covers all topographical features as well as such pertinent aspects as weather, industry, transportation, communications, billets, provisions, sanitation, etc.

Pages 1 through 124

COMPLETE TRANSLATION

Doc No 256736

# MILITARY TOPOGRAPHICAL STUDY OF WESTERN BAIKAL



Army Section
Imperial General Headquarters

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## PREFACE

This study is based on research materials of the Kuantung Army and was printed immediately after supplementary modifications were made by Imperial Headquarters. When future material is received, it is expected that revised reports of more detailed and accurate nature will be made.

1. This study deals with military topography in the area centering around Buryat-Mongolia ASSR and Irkutsk Oblast. It may serve as an operational guide for higher commands and may also be used by divisions and smaller units as reference material in tactical operations.
2. Its scope is indicated by supplementary maps.
3. In using this study, reference must be made to the supplementary maps and charts.

Part 1. TACTICAL OBSERVATIONS

## I. SUMMARY

### A. Strategic Importance of the Area

1. The area included in this study (the Irkutsk Oblast, Buryat-Mongolian ASSR, and northern Outer Mongolia) covers some 1,230,000 square kilometers (this area measurement excludes the northern part of Outer Mongolia), has a population of about 2,150,000, and is important as a rear-area supply base for Soviet Army air bases covering Manchuria, Inner Mongolia, and North China. The Siberian Railway provides a link with Eastern USSR: The Man-chou-li branch line, Naushinski branch line, and the Selenga River transportation provide links with Outer Mongolia. Further, the airfield groups in the area serve as important air bases between Europe and Asia. Recently, the development of the arctic route and of the US-Soviet air route has increased the strategic value of this area.

2. The area around Lake Baikal links Eastern USSR and Outer Mongolia to European Russia and forms a bottle neck from the point of view of communications. To cut this line is very important from a strategical viewpoint. However, to reach this region from Manchuria and Inner Mongolia, a wide barren stretch of land must be crossed. Because of the /difficulty of the terrain/ along the important lines of communication, there would be a great deal of difficulty in carrying out military operations, especially in sub-zero weather.

3. Military operations in this area in general will be along the following lines: (1) advance carried out along the important lines of communications, and (2) air-ground penetration.

### B. General Observations on Military Topography

1. Terrain:

In the eastern part of this area, the Yablonovy Range runs from the southwest to the northeast and is the roof of the Siberian Area. It is not exaggerating to say that, in the wide sense, it separates the Pacific from the Arctic Ocea. However, northwest of this range, the mountains gradually decrease in height and, northwest of Lake Baikal, they level out into a plateau about 500-600 meters high. The mountain terrain is generally quite rolling, but, except for the Sayanski Mountain Range and the Lake Baikal region north of the railroad, both elevation and gradient are not to extreme. There are occasional extremely rocky areas and many precipices. Most of the area is wooded, the greater part being covered with dense growth. There are swampy areas in the river valleys. These are hindrances to communication routes and are not suitable for movement of large units.

2. Communications:

There are several roads which may be used as communication routes from east to west, such as the old Moscow Road from the Chita area to the Irkutsk area on the north side of the railroad. There are several routes from the Outer Mongolia area to the strategic areas along the railroad via the Selenga River basin. Along each of these routes, it is possible for an infantry group to maneuver.

The Siberian Railway, which cuts the area from east to west, is the continental artery which connects Europe and Asia. Consequently, the isolation of this artery is of vital importance strategically. Especially is this true of the route skirting Lake Baikal. It is important to understand that, if this route were destroyed, it would be physically impossible to build another because of the terrain.

Lake Baikal, about 600 kilometers long, forms a barrier across the east-west communication routes in this area; to the south there is only a railroad and a few second-rate automobile roads. The cliffs rise abruptly from the lake shores. These factors make this area a gigantic bottle neck from the standpoint of transportation.

NOTE: Before the railroad was built along the shores of the lake, steamboats were used in the summer and sleds during winter on the lake. However, it is known throughout the world that this is a stormy region. During the autumn season, winds frequently reach a velocity of 15 meters per second, constituting a great obstacle to navigation. Furthermore, in the winter there are large cracks and numerous large holes in the ice, making traveling by sled dangerous. The Irkutsk and Ulan Ude areas are gateways to the routes which cut through the barrier presented by Lake Baikal, and these are key points from the standpoint of transportation and terrain. The possession of these plains make it possible to control military operations in the area.

3. Weather:

The weather is markedly continental, and the difference in seasonal temperature is extreme. The season which is most suitable for land operations is the period between the end of March and November. In sub-zero weather, maneuverability is very restricted and causes a great deal of difficulty in operations.

There are no major obstacles to air operations throughout the year, but, during the summer, there are many low-cloud formations which are an obstacle to flying. This area of low clouds is located around Kirensk and Bodaibo on the southeastern shore of Lake Baikal.

4. Billets and Rations:

With the exception of the area along the railroads and various roads, the operations of an infantry group are severely restricted as regards both billets and rations. The population along the river basins of the Selenga and Ingoda Rivers is fairly dense, and goods are comparatively plentiful, and the procurement of billets and rations for troops, simple. In other areas, however, the population is very thin, and rations and billets are virtually unobtainable. This area has reached the self-sufficiency stage just recently; hence, once the area becomes a battle ground, the native populace will flee, which in turn will create undue complications in the local procurement of goods.

5. Sanitation (Hygiene):

In the spring and fall, there is no cause for anxiety as far as sanitation is concerned. In the summertime, however, intestinal and contagious diseases are prevalent, and there are many small insects that are harmful to personnel and animals. Thorough measures are necessary in the prevention of disease. In winter, the cold is severe, and, because prolonged operations in such a climate drastically reduces fighting efficiency careful consideration must be given to maintaining the comfort of personnel and to preventing frostbite.

## II. STRENGTH, ORGANIZATION, COMPOSITION AND EQUIPMENT OF AN OPERATIONAL ARMY

A. In military operations in this area, the problem of supply is very important for both sides, and it is not exaggeration to say that it would be a war of logistics. For this reason it is necessary to note the items listed below:

1. Transporting Supplies:

a. In order to ensure adequate supplies, air transports are necessary.

b. Make use, as transport organizations, of railroads; trucks and ships. Transportation, repair, and supply facilities of the engineers and other branches of the service should be reinforced. In the future, air transports will become more and more important.

c. For important military stores, antifreeze storage materials are needed.

2. Isolate and disrupt enemy supply lines. For this purpose, air powers must be increased, and bold, imaginative utilization of air-borne raiders and ground striking units is necessary. In unit organization, it is necessary to allocate appropriate strength according to objectives.

B. Ground Forces

1. This area is mostly mountainous and forested and, with the exception of areas which run along the main communication routes, it is unsuitable for large-scale operations.

Each infantry group will be, for the most part, a pack organization, and [the number of] engineers will be increased. Also, a powerful construction unit will be needed for developing new supply routes.

2. Independent command status will be given to units.

3. The number of river-transport companies and bridge-building companies should be increased to cope with river barriers.

4. Away from the railway routes and the important river valleys, bivouacking is necessary. Hence, it is important to furnish complete bivouac materials and also to study methods for obtaining fuel in winter. Increased equipment for well-digging and fuel wood will be carried.

5. With supplies concentrated in the cities, procurement of them is difficult in this locality.

The supply organization should be greatly strengthened, and it is advisable to use trucks in the rear area and pack-horses in forward areas.

6. It is necessary to consider carefully the use of gas warfare, because of the peculiarities of weather and terrain.

7. Medical and veterinary supplies are generally impossible to provide in this area and, therefore, should be carried.

8. Although there is not a great amount of snowfall during the winter season, skis and sled are utilized as the only means of travel; so, it is very necessary to plan for collecting and equipping the troops with draft animals and ski materials.

## III. TACTICS SUITABLE TO SPECIAL CHARACTERISTICS OF THE AREA OF OPERATIONS

### A. Aviation

Because of the special nature of the operational area, control of the air, disruption of the enemy lines of communications, the utilization of air-borne units, liaison with and supply of raiding and other ground units, etc., necessitate the strengthening of air bases and air-borne units.

### B. Movements

Movements are limited essentially to the areas along the main communication routes, and, because of this, it is vitally necessary to hold these routes at all cost. But, at the same time, consideration must be given to minimizing losses in personnel and equipment. However, in the light of strategical and tactical demands, it is necessary to carry out maneuvers in the forests and barren mountain areas over a long period of time. For this reason, every infantry group must become accustomed to operations in this type of terrain and must endeavor to overcome terrain disadvantages by the suitable utilization of raiding and air-borne units.

### C. Battles

Of necessity, battles which occur in this area are fought in mountain and forest areas and especially in narrow

defiles. Hence, it is necessary to become accustomed to this type of warfare, and, at the same time, raiding and air-borne tactics will be resorted to as much as possible.

D. Fortifications

The area to the east of Lake Baikal is composed of igneous rocks and to the west, of sedimentary rocks. The surface is generally sandy. In the mountain areas, however, the soil is thin and rocky, and it is difficult to construct fortifications. This is especially true in winter when the surface freezes to a depth of 3 meters or more. Some means must be found to meet this difficulty.

E. Billets

This is generally a sparsely-populated and barren region; consequently, aside from cities and places along the railway lines and the important river valleys, it is impossible to billet troops. Moreover, in the winter, the weather is too cold to remain bivouacked in the open for a long period of time without seriously hampering the fighting efficiency of the troops. For this reason, it is necessary that each infantry group train for open bivouac in cold climate. Also, improvisation of billeting materials should be considered.

F. Supply

Operations in this area may be termed a "war of logistics." Furthermore, in this area, various contagious and endemic diseases are prevalent, and the winters are extremely cold. The acquisition of medical materials and the utilization of medical facilities on the spot cannot be anticipated. Consequently, it is very necessary for rear service units to advance as close as possible to the front lines, and, for this reason, service troops should be given a certain amount of combat training.

G. Transportation

Since this area has a few good roads, routes of advance and lines of communication of an operational army are necessarily dependent upon a limited number of roads. Consequently, the invading force must plan for the best possible use of the existing road facilities and to preserve and extend them as much as possible.

H. Other Points

The racial stock of the people who are separated by quite a distance from the railroads in this area is diverse, and the history of their social structure, practically non-existent. They were subject to pressure and compulsion on the part of the USSR in their formation. Co-existent with the special nature of the terrain, there are numerous weak points which permit internal propaganda within one level of the social strata. In obtaining peace and harmony in this region, the use of people to our advantage by clever application of this weakness will be a necessary element, together with the use of military prowess.

**PART** 2. TOPOGRAPHY AND GEOLOGY

## I. OUTLINE OF TOPOGRAPHICAL FEATURES

From the point of view of the formation and characteristics of the topography of this area, it can be divided into two areas: the mountain area east of Lake Baikal and the Central Siberian Steppe area west of the lake. Moreover, the entire region is covered with forests, and the communication routes are few in number. Generally, it is not suitable for the movement of large units. Since the areas east of Lake Baikal and the Sayanski Mountains are exceedingly rough and communication routes few, troop movements are very limited.

The Central Siberian Steppe area which lies north of the Lena and Angara Rivers is composed of several parallel plateaus which have been formed by river erosion and extends like a mountain range along the water sheds of these rivers. It is a steppe area with hills here and there, having a general elevation of 500-700 meters. The plains form several steps which are gently inclined; infantry would have no difficulty, but, in places where they are exposed traprocks, the terrain becomes precipitous.

China, Ulan Ude, and Irkutsk are strategic important points in this area.

### A. The Mountain Area East of Lake Baikal

1. The Yablonovy Mountain Range runs on a northeast-southwest axis and, toward the south, its elevation increases gradually. In the vicinity of the Soviet-Mongolian border, the elevations reaches more than 2,500 meters. Although the western slope of the range is, for the most part, quite gentle, the eastern slope is quite precipitous, and there are many cliffs. Many mountain peaks are barren of any vegetation, and, at times, even during the summer, there are places where the snow still remains. At about the halfway mark of the slope, the timber line begins, and there is a profusion of passes, slopes, saddles, etc. Piles of talus litter the area. Troop movements are difficult (or impossible) in most places.

2. The Vitim Steppe area is a high plateau surrounded by the Muyski Range to the north, the Yablonovy Range to the east, and the Ikatski Range to the west, with the highest points between 1,000-1,800 meters (average elevation, 700-100-meters). The slopes are steep, rivers form many narrow gorges, and forest growth cover the entire area. The lowlands are covered with swamps and are not suitable for transportation. It is difficult for large infantry groups to operate in this area.

3. The area between the Yablonovy Mountain Range and Hamardaban Mountain Range:

a. The Malkhansi Mountain Range is covered with forests and traprocks and, moreover, has very steep slopes. There are numberous spots where individual troops would find movement difficulty.

The Zaganski Mountain Range extends in a general east-west direction and, although its outline resembles that of Tsagandaban Mountain Range, it is a bit steeper; the northern slopes are generally steeper than the southern slopes, with a gradient of 20-30 degrees.

However, there are many places where it has a gradient of 45 degrees. There are dense forests on the northern slopes, with only sparse growth on the southern slopes. The mountains extend to the banks of the Khilok River and sometimes form precipices which are approximately 150 meters high. Generally, the western half of the mountain range is steeper than the eastern half. On the steep back slopes of the range, there are many marshy areas covered with fallen trees, and even an individual soldier will find the going difficult.

c. The Tsagandaban Mountain Range runs east and west, and its topography is generally steep, especially the northern slopes. The northern slopes are covered with tree growth, but the growth on the southern slopes is not dense.

Generally speaking, the western half of the range is very rugged, but, as compared with the eastern half, it has gentle slopes. Both infantry and cavalry can move with ease throughout the area.

The mountain range running from east to west located south of Tsagandaban Range has a width of 6-7 kilometers and is about 80 kilometers long. This mountain range is, in actuality, a group of small hills. There are no branch ranges. Tree growth is not dense, and almost the entire area is cultivated land. Troop movements are easy.

d. Although the Ulan Burgasy Mountain Range is an extension of the Khamardaban Mountain Range, it's average height is 300-600 meters; it's terrain is generally not rugged, and, at the base /of the mountain/, forms a tableland, which is covered with forests.

4. The Area South of Lake Baikal:

a. Hamardaban Mountain Range:

The north side of this range is rather steeply inclined and rises up from Lake Baikal. Its valleys are narrow and steep and densely covered with trees. On the other hand, the Jida River Valley on the south side is gently inclined and is made up of broad, treeless valleys. The mountains themselves are covered with a luxuriant forest growth, and the summits are covered with snow for all but a short period of about a month during the summer. The average height of the range /above Lake Baikal/ is 1,500-1,700 meters; it is steep and precipitous and talus is strewn everywhere. It is a confused, entangled mass of mountains; fallen trees are abundant. Passage is impossible except along the native trails.

The various branch ranges to the east gradually turn into hills as they approach the Selenga River and, finally, become a broad and rolling plain where movement is easy.

b. Bolgoiski Mountain Range:

Although this does not form a clear-cut mountain chain, it has numerous branch ranges. The main range is mostly forest-covered, talus slopes are numerous, and movement is difficult. Although the western and southern slopes are gently inclined, the northern and eastern slopes are quite precipitous, and these steep cliffs run close to the Temnik and Selenga Rivers.

c. The Dzhidinski Mountain Range forms the border of Outer Mongolia and is the watershed of the Jida and Zhelturi Rivers. The northern side has a very steep slope running along the Jida River. It is generally forested, and movement is difficult.

d. The Khanginski Mountain Range has an average height of from 600-800 meters and rugged features forming precipices here and there. The eastern slopes are mostly barren, except for an occasional sparse growth of thicket, but the rest of the range is thickly forested. The soil is sandy and rocky. There are swamps in the valleys, and movement is usually very difficult.

e. The Monostoi Mountain Range has an average height of 400-600 meters and forms the watershed of the Selenga River and Lake Gusinoe. It is gently inclined, for the most part, and movement is easy. However, near the banks of the Selenga River, it becomes slightly steeper. Almost the entire range is covered with forests; the soil is sandy and hard; while here and there are outcrops of rocks.

5. The Sayanski Mountain Range Area:

a. The main Sayanski Mountain Range has an average elevation of about 2,000 meters, although its higher peaks tower above that elevation, especially Mount Munko Sardik, which has an elevation of 3,491 meters. The range appears steep and broad. Although the mountain peaks usually appear to have the character of tablelands, in some places they present a saw-toothed appearance. The surface is rocky and swampy in some places, and it is an area unexplored by man. There are many sections in which even individual troops would find going very difficult. Snow is absent only for a short time during the summer, and there are places which still show a trace of the Glacier Age. Above 1,500-1,600 meters, there are usually no trees.

b. The Tunkinski Mountain Range is a gigantic mountain chain which presents a very precipitous appearance. Its average height is from 1,000-1,500 meters. It is very steep and has numerous sharp peaks which tower up to present a saw-toothed appearance. The surface is strewn with rocks and boulders. Forests of dwarf larches are found along the lower slopes. The mountain peaks are covered with deep snow from August to the end of June. The peaks are exposed for only one and a half months. Even during the summer, traversing the mountains is difficult, as the only passages across the range are small footpaths known only to a few hunters.

c. The Kitoiskiye Mountain Range starts from the eastern part of the Sayan main range and forms the watershed of the Kitoi and Belaya Rivers, and is generally quite steep. The range has barren peaks here and there.

d. The Belsk Mountain Range is comparatively low, and its slope is gentle. The mountain peaks are forest-covered.

B. <u>The Central Siberian Plateau Area</u>

1. Area Along the Railway Line, West of Lake Baikal:

a. The area on the right bank of the Angara River south of Irkutsk, compared to the left bank, is a region of comparatively low mountain chains. The slope is gentle and there are no obstacles to the movement of troops. The mountain areas are usually littered with rock, but are covered with humus. The rocks are exposed only on the summits. In the valleys, there are many places suitable for cultivation.

b. The Irkutsk, Baikal, Kultuk Triangle:

The mountain area has an average height of 200-300 meters, and the slope is generally steep and barely permits the ascent and descent of infantry and cavalry troops. The mountain area is generally rocky, the soil is thin, and there are many rock outcrops. The summits are rocky and sharp. The slope facing Lake Baikal is especially steep and forms cliffs on the shore.

c. The area northeast of Irkutsk is generally open and broad and is hilly only on the right bank of the Angara River. Its slopes are relatively low and gentle and have dense forest cover. Movement of infantry and cavalry troops is possible, but passage of military vehicles is difficult.

c. Area between Irkutsk and Zima:

The hills form the right bank of the Angara River in many places, but the left bank borders on a level plain. The hilly areas beyond each bank are covered with dense forests. Between Cheremkhovo and Zima, copses are scattered here and there.

e. Area between Zima and Nizhne Udinsk:

Apart from several plains between the Tulun and Iya River valleys, the region is mountainous, generally quite steep, and forest-covered.

2. Upper Reaches of the Lena River:

This area is generally hilly, with some level areas, and covered with larch and white birch trees. The valleys are not precipitous and the river banks form distinct steps. However, the valleys of tributary streams are narrow, and, in places, steep cliffs rise from the river banks to a height of some 300 meters. The tops of these cliffs are flat and maintain their height as far as the confluence of the Olekma River.

3. Area Northeast of the Vitim River:

a. The Kropotkina Mountain Range runs east and west and is composed of barren peaks.

Between the Chara and Olkema Rivers, there is a lowland area where the river overflows its bank. The gorges are lined on both sides with low cliffs characteristic of this area.

b. The Patomsk-Vitimskaya Plateau:

The northwestern part has isolated plateau-like barren peaks separated by gorges. It forms a broad, flat watershed. Toward the east, it gradually rolls downward and becomes a broad, flat plain. Here and there are swampy river basins. In the north and northwest is the Patomsk Plateau with an elevation of 400-500 meters. It forms the source of several tributary streams of the Lena and Chara Rivers.

c. The Vitim-Olekminskaya Plateau is a mountainous area between the middle reaches of the Vitim River and the upper and middle reaches of the Olekma River, the highest points following the watershed of the above-mentioned rivers. It is about 1,500-1,600 meters in elevation. Mount Longtor, in the vicinity of the headwaters of Taksima River, is 1,955 meters high.

The range runs north and south for the most part and is the source of several tributaries of the Vitim River and of the Chara River and its tributaries. It is composed of barren peaks and the gorges are lined with low-hanging cliffs. In the southern part, swamps are found between these cliffs.

## II. GEOLOGY AND SOILS

### A. Geology and Soils

The territory east of Lake Baikal is composed almost entirely of igneous rocks and, to the west, of sedimentary rocks. The surface is sandy and clay-like for the most part. The surface of the mountain slopes west of the Angara River is almost entirely of clay. Moreover, the higher slopes of every mountain range are rocky, with only a slight erosion of surface. There is difficulty in obtaining water and in construction of fortifications.

Apart from the sandy areas centered around the basin of the Selenga and along the banks of other rivers, note should be taken of the location of the permanent-frozen subsoil areas.

### B. Permanently Frozen Subsoil

In general in this area, frozen subsoil in isolated groups is found among seasonally frozen topsoil. Permanently frozen subsoil begins at a certain depth below the surface ; the top layer is composed of earth that thaws during the summer and freezes again in the winter. The thickness of the "active layers" becomes greater as you go south, but this depends further on the soil type. (Greatest thickness in cases of sandy soil, least thickness in cases of peat).

Depth of Seasonally Frozen Topsoil According to Soil Type

| Soil Characteristics | South of 55' N | 60'-65' N | Shores of Arctic Ocean |
|---|---|---|---|
| Various Sandy Soils | 3-4 M | 2-2.5 | 1.2-1.6 M |
| Various Peat Soils | 0.8-1.0 M | | 0.2-0.4 M |
| Various Clay Soils | Approximately between the limits of the above soils | | |

In the mountain areas, the seasonally frozen topsoil is thick on the southern slope and thin on the northern slope. In the moss-covered area of the extreme north, it is very thin. In well-drained soils, it thaws to quite a depth; the opposite is true in swampy areas. In cases where the subterranean water is close to the surface, the thickness of the "active layers"is increased. In the winter, the presence of this water prevents the freezing of the soil.

Because investigation of the permanently frozen subsoil is difficult, not too much is known about it, but the thickness is from less than 1 meter to more than 100 meters.

| Localities and Areas Actually Surveyed | Thickness of Permanently-Frozen Subsoil | Limit of Survey |
|---|---|---|
| City of Yakutsk | 114 m | Survey of all strata not completed |
| Bushulei | 66-67 m | Survey of all strata not completed |
| Left Bank of Seya River: Kelashimovski Colony | 50 m | Survey of all strata not completed |
| Nizhne-Tunguska River Basin | 25 m | All strata surveyed |

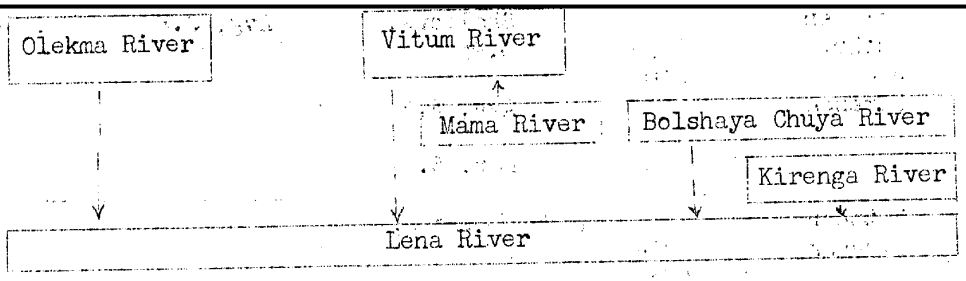
III. RIVERS, LAKES, SWAMPS, GLACIERS, FORESTS, ARABLE AREAS AND GRASSLANDS

A. Rivers

The most important rivers are the Lena and the Angara, which can be used for supply and traffic routes. Because they do not have very much relationship to expected areas of important military operations, their military value is slight. Furthermore, they freeze over in winter, making movement impossible.

1. Lena River System:

The important rivers of this system are listed below:




a. The Lena River (from its head waters to the Olekma River) is 1,960 kilometers long and covers an area of 782,440 square kilometers.

| Section | River Width (m) | Depth of Water (m) | Velocity of Current (m/sec) | River Bottom, Bad Fordability | Freezing and Thawing Periods |
|---|---|---|---|---|---|
| Vicinity of Kachuga | 65-100 | Shallows, 0.2-0.3<br>Slow stream, 2-3 | X | X | In vicinity of Kirensk, the freeze sets in from the end of October to the beginning of November. The thaw is from the beginning to the middle of May. Ice flow lasts about 7 days. In the vicinity of Mitim, the thaw is about the middle of May. The ice is about 1.0 meter thick on the average |
| Vicinity of Zhigalovo | 80-140 | Avg, 1.4<br>Max, 4.0 | Shallows, 1.4-1.8<br>Main stream, 1.0 | X | |
| Between Zhigalovo and Ustkut | 130-320 | Shallows, 0.3<br>Avg, 2.4<br>Max, 4.5 | Shallows, 1.4-1.5<br>Gentle stream, 0.8-1.0 | X | |

| | | | | | |
|---|---|---|---|---|---|
| Between Ustkut and Kirensk | 175-410 | Shallows, 0.95<br>Avg, 2.8<br>Max, 5.0 | Avg, 0.8 | X | |
| Between Kirensk and Vitim | 220-575 | Shallows, 1.0<br>Avg, 5.0<br>Max, 10.0 | Avg, 0.7-0.8 | X | |
| Between Vitim and Olekma | 425-2,000 | Shallows, 2.0<br>Max, 12.5 | Avg, 0.8 | X | |

NOTE: Between Kachuga and Zhigalovo, there are 77 shallows. Floods occur during the rainy season and the thaw. At times, a 3-meter rise in water level is noted. In general, high water occurs in the summer.

There are mountainous areas on either bank, rising to an average height of 300 meters; the hills run to the banks, forming steep cliffs in some places, but, in other places, the valleys are broad and swampy. The hill areas, in general, are densely forested.

b. The Kirenga River is about 533 kilometers long, and its basin covers and area of 46,150 square kilometers.

| Section | Width (m) | Depth (m) | Velocity of Current (m/sec) |
|---|---|---|---|
| Between Tarasovo and the river mouth | 600-2,500 | 0.6-0.7 at shallowest point. | 1.6-2.4 |

NOTE: The river basin has a relatively large population.

c. The Bolshaya Chuya River is 353 kilometers long; its basin area is 12,650 square kilometers.

| Section | Width (m) | Depth (m) | Velocity of Current (m/sec) |
|---|---|---|---|
| Between Chuya and the river mouth | Avg, 191 | 1.8 | 1.0 |

d. The Vitim River is 1,638 kilometers long; its basin area covers 221,650 square kilometers.

| Section | Width (m) | Velocity of Current (m/sec) | River Bottom |
|---|---|---|---|
| Between Notura River mouth and Umkantar River mouth | 160-170 over-all<br>75-85 in rapids | 1.8-2.0 over-all;<br>5.0 in rapids | Sand and gravel |
| Lower reaches of Turyhai River | 170-200;<br>300-400<br>near mouth | 1.5 | |
| Lower reaches of Tsipa River | Max, 400 | 1.7 | |
| Lower reaches of Bodaibo River | 300-430 over-all<br><br>Max, 850 | Avg, 2.2<br><br>Max, 2.5 | |

Freeze: From mid-Dec to latter part of Dec (earliest was 14 Oct 1916; latest, 1 Jan 1916).

Thaw: Mid-May (earliest, 8 May 1917; latest, 26 May 1913).

e. The Mama River

| Width (m) | Depth (m) |
|---|---|
| 100-200 | Average, 1.1-1.5<br>Shallows, 0.7-0.9 |

Freeze: Latter part of Oct.

Thaw: Mid-May.

NOTE: All tributaries of the Mama River are narrow; 5-20 meters wide.

f. The Bolshoi River is 459 kilometers long; its river basin has an area of 24,640 square kilometers.

| Section | Width | Depth | Velocity of Current (m/sec) |
|---|---|---|---|
| To 6 Kilometers Upstream from River Mouth | 230 | Min, 1.6 | Max, 2.2 |

Freeze: Latter part of Oct.

Thaw: Mid-May.

g. The Olekma River is 1,141 kilometers long; its river basin has an area of 203,550 square kilometers.

| Section | Width | Depth | Amount | Bottom | Notes |
|---|---|---|---|---|---|
| Between the confluence of the Bagramakit and Tungir Rivers | 70-200 | Min, 0.65<br>Avg, 3.0<br>Max, 6.0 | 1.2-1.8 | Pebbles and gravel | 29 shoals<br>6 hazardous places |
| Between the confluence of the Tungir and the Khanir Rivers | 150-300 | Min, 0.85<br>Avg, 4.0<br>Max, 10.0 | Max, 3.0 | Gravel | 21 shoals<br>4 hazardous places |
| Between the confluence of the Khanir and Yenyuka Rivers | 75-400 | Min, 2.0<br>Avg, 4.0<br>Max, 10.0 | Avg, 0.9<br>Shallows, 3.0-4.0 | Boulders | 37 shoals<br>4 hazardous places |
| Between the confluence of Yenyuka and Lena Rivers | 300-700 | Min, 3.5<br>Avg, 7.0<br>Min, 20.0 | Avg, 0.5-1.2 | Gravel and small rocks | 12 shoals<br>2 hazardous places |

Freeze: Middle to latter part of Oct.

Thaw: Mid-May

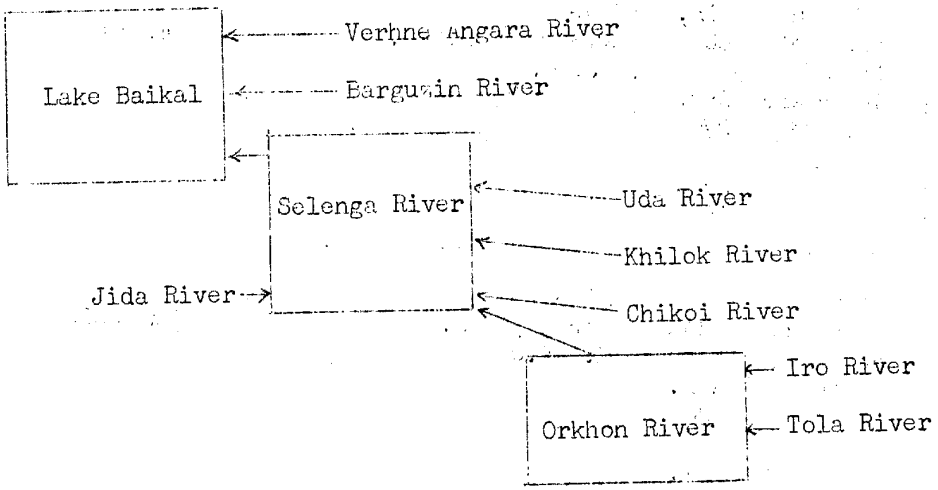
h. The Chara River is about 853 kilometers long, its river basin has an area of 84,040 square kilometers.

| Section | Depth | Velocity of Current (m/sec) | Bottom |
|---|---|---|---|
| X | Shallows, 0.55 | 0.7-1.3 | Gravel and Large Rocks |

Cliffs are rarely seen. Boats can sail 500 kilometers upstream from the river mouth. Population along the banks is very sparse.

2. Lake Baikal System:

Important rivers of this system are given below:




a. The Verhne Angara River is 640 kilometers long; its river basin has an area of 23,600 square kilometers.

| Section | Freeze Periods |
|---|---|
| Lower reaches | Freeze: Latter part of Oct<br>Thaw: Beginning of May |

b. The Barguzin River is 700 kilometers long; its river basin has an area of 23,000 square kilometers.

| Section | Width (m) | Freeze (Thaw) Period |
|---|---|---|
| | 90-100 | Freeze: Latter part of Oct<br>Thaw: Latter part of Apr to beginning of May |

c. The Selenga River is 1,000 kilometers in length; its river basin area, 456,000 square kilometers.

| Section | Width (m) | Depth (m) | Velocity of Current (m/sec) | Fordability | Notes |
|---|---|---|---|---|---|
| Below the confluence of Orkhon River | Min, 95<br>Avg, 166<br>Max, 216 | Mid-stream, 2.2-5.9 | 1.0-2.0 | Impossible | 53 shoals<br>16 hazardous places |
| Between mouth of Chikoi River and Ulan Ude | Min, 80<br>Avg, 270<br>Max, 560 | Mid-stream, 2.4-4.5 | 1.5-2.0 | Impossible | 17 shoals<br>1 hazardous place |
| Between Ulan Ude and Kabansk | Min, 120<br>Avg, 280<br>Max, 550 | Mid-stream, 2.7-5.0 | 1.0 | Impossible | 19 shoals<br>6 hazardous places |

Freeze: Latter part of Oct to early Nov.

Thaw: Middle to latter part of Apr.

The Selenga River joins the Jida, Chikoi, and Khilok Rivers and empties into Lake Baikal. It links Irkutsk, Buryat-Mongolian ASSR, and Outer Mongolia and forms an important communication route. Boats of 0.6 meter draft can proceed from the mouth of the Chikoi River upstream for 350 kilometers; during high water, boats with a draft of over 6 meters can use the river.

d. The Tola River

| Section | Width (m) | Depth (m) | Bottom | Fordability |
|---|---|---|---|---|
| Vicinity of Ulan Bator | 45-65 | 0.6-1.2 | Pebbles | Possible to ford near shoals |

e. The Roi River

| Section | Width (m) | Depth (m) | Bottom | Fordability |
|---|---|---|---|---|
| Lower Reaches | 65-100 | 0.7-1.5 | Small stones | Impossible |

f. The Jida River is 496 kilometers long; its river basin has an area of 23,000 square kilometers.

| Section | Width (m) | Depth (m) | Velocity of Current (m/sec) | Bottom | Fordability |
|---|---|---|---|---|---|
| Between Atamano-Nikolaevsk and Narynskaya | 50-90 | 0.7-1.5 | 2.5 | Small stones | Several fordable places |
| Vicinity of Zaitsevski | 100-120 | 2.0 | 1.5-2.0 | Pebbles | |
| Below Stary-Enkhor | 85-220 | 1.7-3.0 | 1.3 | Pebbles | |

g. The Chikoi River is 713 kilometers long; its river basin has an area of 43,200 square kilometers

| Section | Width (m) | Depth (m) | Velocity of Current (m/sec) | Bottom | Fordability |
|---|---|---|---|---|---|
| Between Yamarovka and Kholok-hoyevo | 90 | 1.0-2.1 | 1.0-2.5 | Sand | Possible on horseback |
| Between Kholok-hoyevo and Shebartuy | 100-210 | 1.2-3.0 | X | Gravel | |
| Between Shebartuy and river mouth | 210-400 | 2.5-4.0 | X | Gravel | Impossible |

Freeze: Beginning of Oct.

Thaw: Middle to latter part of Apr (ice about 1 meter thick).

NOTE: Small boats can navigate downstream from middle reaches of the river. The Chikoi River has no bridges. Crossings are made by "karuyasu" (TN: Native boat). High-water periods occur twice a year: once during the rainy season, and once during the thaw. During this time, the water level rises over 6 meters. However, the increase in water level during the rainy season is not great.

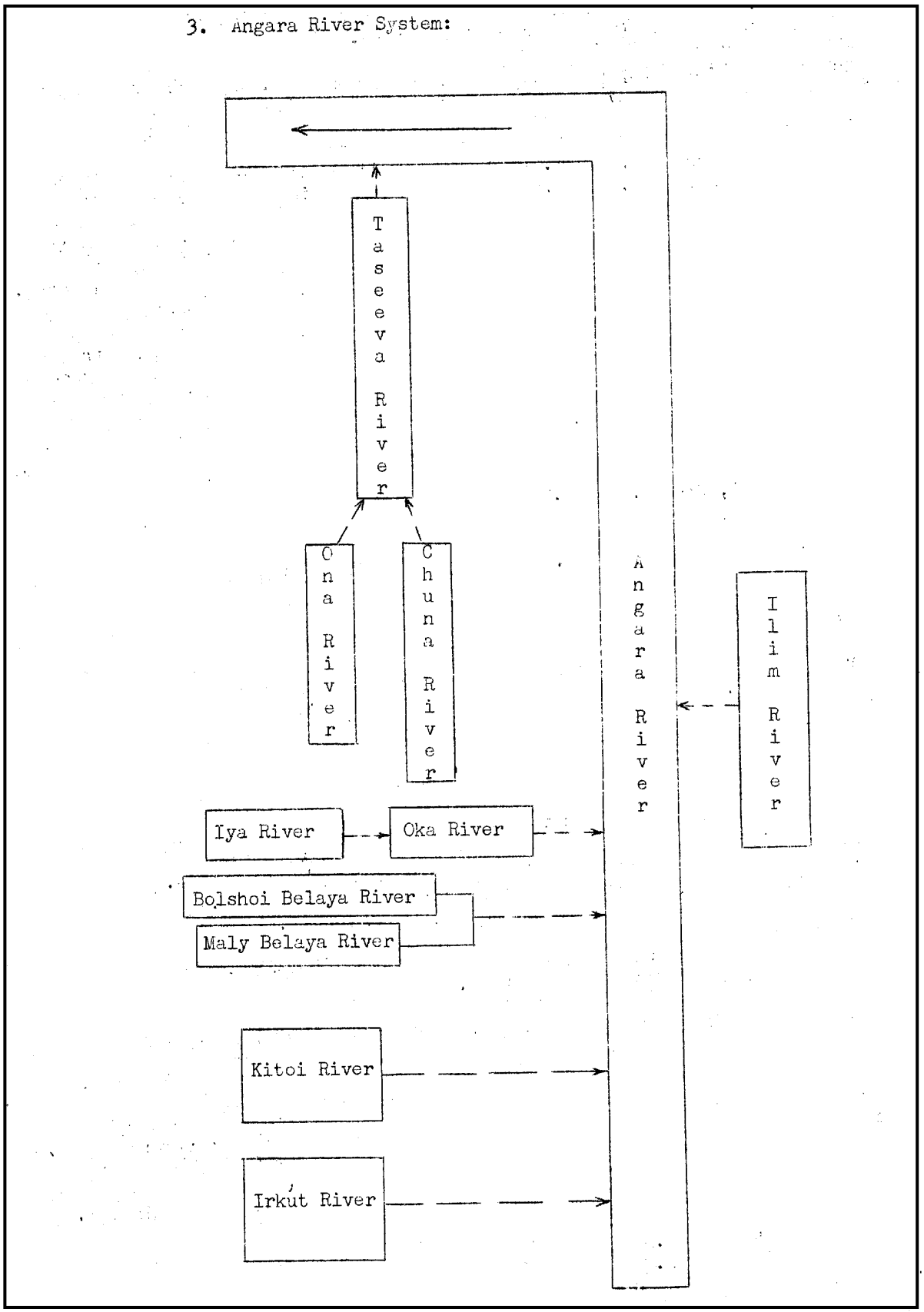
h. The Khilok River is 720 kilometers long; its river basin has an area of 39,800 square kilometers. (Note: No bridges).

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Fordability | Thaw and Freeze |
|---|---|---|---|---|---|---|
| Between Nangirtui and Tarabagatay | 85-130 | 1.5-3.0 | 1.8-2.0 | Small pebbles | Upstream from Nangirtui, | Freeze: mid-Oct<br>Thaw: |
| Between Tarabagatay and river mouth | 120-150 | 3.0 | 2.0 | Pebbles | Possible on horseback | middle to end of Apr |

i. The Uda River is 330 kilometers long.

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Fordability | Thaw and Freeze |
|---|---|---|---|---|---|---|
| Near confluence of Tudon River | 70-80 | 0.7-1.0 | Slow | Fine Sand | Possible above confluence of Tudon River | Freeze: early No<br>Thaw: latter part of Apr |
| Between confluence of Kurba River and river mouth | 100 | 1.5-2.0 | Slow | Sand | | |

3. Angara River System:



a. The Angara River is 1,853 kilometers long; its river basin has an area of 501,800 square kilometers.

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Fordability | Freeze and Thaw | Notes |
|---|---|---|---|---|---|---|---|
| Vicinity of mouth | Narrowest, 958 | 1.3-2.5 | 1.7-2.5 | Pebbles | Impossible | Middle and lower reaches freeze in early or middle Nov: thaw, middle of May. | From the river mouth to Irkutsk, it does not freeze even in the coldest of weather. |
| Vicinity of Bratskoye | 1,000-1,700 | 2.8-5.0 | 0.68 | Pebbles | Impossible | | |
| Near confluence of Ilim River | 750 | 2.1-8 | 1.1 | Small pebbles | Impossible | | |
| Near confluence of Yenisei River | Widest 2,000 | 2.5-4.5 | X | Small pebbles | Impossible | | |

In the middle and lower reaches of the Angara River, especially in the vicinity of the Padunskoye Rapids, the river is 800-900 meters wide, and the rapids themselves, 4 kilometers long. It has a slope of 0.016 meters, and the current velocity is 4.48 meters per second. Boat transit is very difficult here.

b. The Irkut River is 467 kilometers long; its river basin has an area of 15,600 square kilometers.

| Section | Width (m) | Depth (m) | Current Velocity in (m/sec) | Bottom | Freeze and Thaw | Notes |
|---|---|---|---|---|---|---|
| Vicinity of Tibeiti | 200 | X | X | Pebbles | Freeze starts latter part of Oct: thaw starts mid-Apr. | The volume of flow per year is very uneven. The water is good for drinking. |
| Vicinity of river mouth | 500 | 1.5-2.0 | 0.5 | Sand | | |

c. The Kitoi River is 322 kilometers long; its river basin has an area of 10,300 square kilometers.

| Section | Width (m) | Current Velocity (m/sec) | Bottom | Freeze and Thaw | Notes |
|---|---|---|---|---|---|
| Vicinity of Yasachnaya | 190 | 0.5-0.9 | Rocky | Freeze: early or mid-Nov.<br><br>Thaw: latter part Apr or early May. | Mountain river: water volume very small. |

d. The Belaya River is 299 kilometers long; its river basin has an area of 19,500 square kilometers.

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Freeze and Thaw | Notes |
|---|---|---|---|---|---|---|
| Near junction of Bolshoi Belaya and Maly Belaya Rivers | 150-200 | 1.5-2.0 | 0.5-0.9 | Pebbles | Freeze: latter part Oct.<br><br>Thaw: latter part Apr. | The river basin abounds in mountain rapids. |

e. The Oka River is 985 kilometers long; its basin area 79,700 square kilometers.

| Section | Width (m) | Current Velocity (m/sec) | Bottom | Freeze and Thaw |
|---|---|---|---|---|
| Vicinity of confluence with Jima River | 100-150 | X | Pebbles | Freeze: latter part of Oct to early Nov |
| Vicinity of Bolshokinskoye | 200-250 | 0.7-0.9 | Pebbles | Thaw: latter part of Apr to early May. |

f. The Iya River is 584 kilometers long; its basin has an area of 36,500 square kilometers. Rapids are numerous.

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Freeze and Thaw |
|---|---|---|---|---|---|
| From vicinity of Tulun to lower reaches | 100-200 | Shoals, 0.5 | 0.56 | Pebbles | Freeze: latter part of Oct-early Nov.<br>Thaw: latter part Apr-early May. |

g. The Ilim River. (NOTE: Water level is highest during thaw, 4-5 meters).

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Ford-ability | Freeze and Thaw |
|---|---|---|---|---|---|---|
| Upper reaches (as far as Ilimsk vicinity) | 40-80 | Shoals, 0.35 | Shoals, 2.0-2.3<br>Midstream 1.0-1.2 | Pebbles | Possible to ford near shoals | Freeze: latter part of Oct.<br>Thaw: early May. |
| Between river mouth and Nizhne Ilimsk | X | Shoals 0.5-0.7<br>Midstream 2.0-4.0 | Shoals, 2.0-2.8 | Pebbles | Impossible | |

h. The Chuna River is 1,158 kilometers long; its basin area, 60,500 square kilometers.

| Section | Depth (m) | Current Velocity (m/sec) | Bottom | Freeze and Thaw |
|---|---|---|---|---|
| Vicinity of Nizhne Ujinsk | Shallow, 0.35-0.4<br>Avg, 1.0-1.5 | Avg, 0.5-0.6 | Pebbles | Freeze: early Oct.<br>Thaw: early to mid-May. |

NOTE: Floods occur during the spring and summer. During the summer (July), water level rises 6-8 meters.

i. The Taseeva River is 117 kilometers long; its basin area is 21,700 square kilometers. (NOTE: Floods occur during spring, and summer. During the summer (July), water level rises 6-8 meters.)

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Fordability | Freeze and Thaw |
|---|---|---|---|---|---|---|
| Upper reaches | 300 | Shoals, 0.9 | Shoals, 4.0-5.0 | Pebbles | Impossible | Freeze: early Oct.<br><br>Thaw: early to mid-May. |
| Lower reaches | 600-700 | X | Shoals, 4.0-5.0 | Pebbles | Impossible | |

4. The Nizhnyaya-Tunguska River is 2,269 kilometers long; its basin has an area of 484,598 square kilometers.

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Fordability | Notes |
|---|---|---|---|---|---|---|
| Between Podvolotino and 200 kilometers downstream | 25-100 | Shallows, 0.32-0.38<br><br>Other areas, 0.5-3.0 | Shallows, 0.4-0.6 | Pebbles | Possible | 50 shallows and rapids |
| Vicinity of Preobrazhenskoye | 200 | Shallows, 0.26-0.45 | Shallows, 0.4-0.6 | Pebbles | Possible | Mountains along the banks slope to river and some are 200 meters high.<br>22 shoals<br>7 rapids |
| From Preobrazhenskoye to Erbogachin | 200-300 | Shallows, 0.55-1.1 | Rapids, 2.5 | Pebbles | Possible near shoals | 20 shoals<br><br>19 rapids |
| From Yerbogachen to confluence of Aika River | Narrowest, 150-170<br><br>Widest, 400 | Shallows, 0.6<br><br>Avg, 1.0-1.5<br><br>Deepest, 6.0 | X | Sand | Impossible | 36 shoals<br><br>7 rapids |

| Section | Width (m) | Depth (m) | Current Velocity (m/sec) | Bottom | Fordability | Notes |
|---|---|---|---|---|---|---|
| From Aika River to confluence of Ilimpeya River | 300-400 | Shallows, 0.36-0.85 | 0.7-0.8 | Sand and pebbles | Impossible | 24 shoals<br>8 rapids |

Freeze: Early-mid Oct (earliest, 4 Oct; latest, 2 Nov).

Thaw: Early-mid May (earliest, 28 April; latest 22 May)

Projected plans for connecting the Nizhnyaya-Tunguska and Lena Rivers:

The Nizhnyaya-Tunguska River runs close to the Lena River in the vicinity of Kerensk (about 16-20 kilometers apart). There was, from an early date, a plan to join these two streams, and a survey was made in 1911. According to the survey, the difference in level of the two rivers is about 90 meters, the Lena River being the lower. Hence, a canal between the two would necessarily cost a great deal of money. Consequently, a paved road connecting the two rivers was decided upon, being a simple and economical solution.

B. Lakes

The most noteworthy lake is Lake Baikal. Southeast of this lake there are many groups of lakes and marshes. Together with the overflowing of rivers during the high water period, these groups offer a considerable obstacle to troops operating in the area. It is possible for steamboats of considerable size to navigate the waters of Lake Baikal.

1. The Chita Lake Group:

| Lake | Surface | | | Depth (Meters) | |
|---|---|---|---|---|---|
| | Length (km) | Width (km) | Area (sq km) | Max | Avg |
| Ivan | 7.0 | 3.0 | 20.0 | 11.0 | |
| Tasei | 7.0 | 2.5 | 16.0 | 2.9 | |
| Arakhley | 11.0 | 6.0 | 65.0 | 19.0 | |
| Shakshinskoye | 11.0 | 6.0 | 60.0 | 6.2 | |
| Indugun | -- | -- | 15.0 | 5.0 | |
| Irgen | 8.0 | 6.0 | 40.0 | 6.0 | |

NOTE: All are fresh water lakes and freeze over in late November or early December and thaw the end of May.

2. The Yeravnoye Lake Group:

| Lake | Surface | | | Depth (meters) | | Notes |
|---|---|---|---|---|---|---|
| | Length (km) | Width (km) | Area (sq km) | Max | Avg | |
| Susnovskoye | 6.0 | 5.1 | 27.52 | 6.0 | 3.4 | Mud bottom |
| Bolshoye Yeravonoye | 13.9 | 13.9 | 141.64 | 6.0 | 3.5 | Mud bottom, sandy shore |
| Maloye Yeravonoye | 10.7 | 9.0 | 85.35 | 4.0 | 2.5 | Mud bottom |
| Malaya Kharga | 4.0 | 3.0 | 12.04 | 3.0 | 2.3 | -- |
| Bolshaya Kharga | 9.5 | 6.0 | 54.45 | 2.5 | 2.2 | -- |
| Isingskoye | 8.7 | 7.1 | 56.00 | 5.0 | 3.8 | -- |
| Gunda | 5.3 | 4.1 | 21.25 | 5.3 | 4.0 | -- |
| Shchuchye | 4.2 | -- | 11.34 | 5.5 | -- | -- |

The freeze starts the middle of October; the thaw, the end of May to the beginning of June. The ice is 1 meter thick or more. In years when there is little water, Lake Malaya Yeravonoye, Lake Kharga, and others freeze to the very bottom.

3. Lake Group to the East of Lake Baikal:

| Lake | Expanse | | | Depth (meters) | | Notes |
|---|---|---|---|---|---|---|
| | Length (km) | Width (km) | Area (sq km) | Max | Avg | |
| Frolikha | 8.0 | 1.5 | 15.0 | 100.0 | 40.0 | Rock and mud bottom; fresh water |
| Goremysk | 0.99 | 0.42 | -- | 7.25 | | Rock and mud bottom; Fresh Water. |
| Isogensk | 1.0 | -- | -- | -- | 1.5 | Mud bottom, swampy shoreline; many aquatic plants. |
| Solenoye | 1.5 | 1.0 | -- | -- | 2.5 | Mud bottom, fresh water |
| Kisloye | 0.5 | 1.0 | -- | -- | -- | -- |
| Dukhovoye | 5.0 | 2.0 | -- | -- | 3.5 | Mud bottom; swampy shoreline |
| Shantaly | 1.5 | 1.0 | -- | -- | 1.0 | Mud bottom; swampy shoreline |
| Kuzhirgansk | 1.0 | 0.4 | 0.24 | -- | 1.0 | Mud and sand bottom; swampy shoreline (saline) |
| Bolshoi Reshchazh, dry lake | -- | -- | 0.20 | -- | -- | Contains water during rainy season only (Saline) |

| Lake | Expanse | | | Depth (meters) | | |
|---|---|---|---|---|---|---|
| | Length (km) | Width (km) | Area (sq km) | Max | Avg | Notes |
| Obto Chinaya-Reshchazh | -- | -- | 0.05 | -- | -- | Saline |
| Dabagaytsi | 0.29 | -- | -- | -- | 0.5 | Quartz and sand bottom; saline |
| Tsuknur | 6.3 | 0.09 | -- | -- | -- | Freshwater lake on Olkhon Island |
| Kotokelskoye | 16.0 | 6.5 | 67.15 | 12.5 | 5.0 | Mud bottom; many types fish |

Generally speaking, the freeze starts in the latter part of October-early November; the thaw, in early or mid-May.

| Lake | Surface | | | Depth (meters) | | |
|---|---|---|---|---|---|---|
| | Length (km) | Width (km) | Area (sq km) | Max | Avg | Notes |
| Gusinoe | 24.5 | 8.5 | 28.0 | 15.33 | -- | Mud bottom; saline |
| Selenginsk | 5.0 | 1.3 | 1.8 | 1.0 | -- | Mud bottom; saline |
| Shchuchye | 2.5 | -- | 20.0 | -- | -- | Fresh water |
| Kuzhr[illegible]ye | -- | -- | 25.0 | -- | -- | Mud bottom; Saline |
| Beloy | 1.5 | 1.0 | 1.5 | -- | -- | Saline |
| Kiranski | 6.32 | 0.21 | --- | 0.5 | -- | Mud bottom; saline |

There are many saline lakes and marshes. Freezing starts in the latter part of October to early November; thawing starts mid-May. Ice is a least 1 meter thick.

4. Lake Baikal:

It is the oldest and the largest fresh-water lake in the world and is the deepest depression on the earth's surface. The mountains along the shore are generally steep and form many capes. They also form deep ravines, and between these ravines are numerous swift streams. In parts, there are flat plains. The largest of these are: the vicinity of Kultuk in the southwest part, the vicinity of Selenga and Barguzin Rivers in the central parts, and the Verkhnyaya Angara River area in the northern part. Along the southwest lake shore where the Siberian Railroad passes, the cliffs press close to the shore and form a long narrow passage.

Special characteristics of Lake Baikal are given below:

a. Name-Called Baikal in Mongolian (which means "abundance"); called Pei-hai in Chinese history (which means "North Sea"); and called Dalai by the Tungus and Dalainor by the Buryats, all these names giving it a religious significance.

b. Surface--636 kilometers long, 79.4 kilometers at widest point, and 47.8 kilometers average width.

c. Formation--Many assume that settling of the earth's surface which created a depression was the beginning of the lake.

d. Area--31,500 square kilometers and seventh largest in world.

e. Depth--In deepest part, 1,741 meters, the world's deepest lake.

f. Capacity--23,000 cubic kilometers, second largest in world.

g. Rivers that empty into the lake: About 336, the largest being the Selenga, then the Barguzin, Verkhnyaya Angara, and Turga.

h. Amount of inflow--Selenga River supplies 83.4 percent of the water. Other rivers freeze to the bottom in winter, and their flow ceases.

i. Outlet--The Angara River; only in an average cold year--1,654 cubic meters.

j. Shore Line--2,000 kilometers (1,999.8). Degree of expansion of the coastline is 3.4.

k. Islands--Olkhen Island, 16 others; total area--742,220 square kilometers.

l. Deltas--Selenga River mouth and the lower reaches of the Angara River.

m. Capes--Many, but most important are Otse, Ishimay, the Sacred Nes, and Tolstei Capes.

n. Storms and Fogs--Storms around Lake Baikal surpass those of the Azev and Black Seas. The maximum percentage of stormy days in the Black Sea is 10.9 percent; while in Lake Baikal it is 60 percent. During the autumn there are gales reaching a speed of 15 meters (per second).

o. Freeze and Thaw--Although the differences are great, depending on the year and on the area involved, generally speaking, the freeze starts in late December and early January. The earliest date was 30 Nov 1905 in the vicinity of Svennichneye, and the latest, 22 Feb 1892 in the vicinity of Gruznovskoye. The thaw is between late April and the middle of May. After the thaw, the strong spring winds and the current of the lake carry the ice flows from the western side of the lake to a definite section on the east side, where it melts, delaying the opening of navigation. Ice remains until approximately the middle of May.

p. Ice--Usually 0.36 - 1.36 meters thick, average 0.92 meters.

q. Navigation--Limited to fixed areas; the period extends from latter part of May to the latter part of October; the longest is of 293 days duration around Listnenichny, the shortest of 169 days duration around Geryachinsk.

C. Swamps and Marshes

There is very little stagnant river water in this area, because of the special nature of topography. Due to the characteristics of a continental climate, there are very few snowdrifts during the winter, and a small amount of rainfall in the summer. The summer is very hot and dry, which discourages formation of marshes. However, marshes are found in the river valleys. Although the marshes offer some difficulties to mobile units, they are very limited, in number and area and do not necessarily constitute a major obstacle.

1. Vitim Plateau has comparatively many marshes.

2. Northeast Transbaikal Area;

Marshy lands are numerous along the foot of the snowless mountains which constitute the watershed for Barguzin, Vitim, Typta, and Muya Rivers. The gorges of the Verkhnyaya Angara and the upper reaches of the Typta and Uda Rivers contain swamps which extend even to higher ground. The swamps occupy about 10 to 25 percent of the valley areas.

3. Grassy Plains Around Lake Baikal:

The area around the lower reaches of the Selenga River, Lake Gusinoe, and the Yeravnoye Lake group, has very slight rainfall, and there are few marshes. Conditions are similar in the vicinity of the Uda River and the Balgansk Plain (Ungo River area).

4. Area of the Lena and Angara Rivers and Berezovy Mountain Range:

There are numerous marshes, not only in river valleys, but also in the mountain forests between the rivers.

5. Between the Lena and Kirenga Rivers:

There are large marshy areas around the lakes in the vicinity of the watershed between the Tutura and Shonuy Rivers, which are tributaries of the Lena and Kirenga Rivers.

6. The Lena River Valley:

The major portion of the area where the Lena and Olekma Rivers join is narrow. The banks are mountainous, and, in the vicinity of the mouth of the major tributaries, there are some narrow marshlands.

7. The Nizhnyaya-Tunguska River Basin:

There are only occasional swamps in the river valleys, which are small in area.

8. The Mountain Area South of Lake Baikal:

In the Khamardaban Mountains, Snezhnaya, Temnik and Jida River area there are many swampy places. The marsh areas are located in small river ravines and, in certain places, extend to the slopes.

9. Between the Angara and Podkamenivaya Rivers:

The Kezhma, Chadobets, and Irikineeva Rivers, which are tributaries of the Angara River, and the Oskoba, Taiga, and Komo Rivers, which are tributaries of the Tunguska River, have valleys dotted with marshlands which seldom extend to the limits of the watershed.

10. Between the Angara and Chunya (Taseeva) Rivers, there are several marshy belts.

## D. Glaciers

In the Sayanski Mountain Range, there are some traces of glaciers having existed from geologic time. These are described below:

1. Glacier on south side of Mount Munko Sardik (vicinity of Lake Kosogol):

The area of the permanent snow field is 0.3 square kilometers. There is no talus and its lower edge is very thin. There are many boulders on the surface of the lower edge where the glacier has deposited them. From the glacier, many narrow streams emerge. There are small, arc-shaped, perpendicular cracks which form a perfect pattern.

2. Glacier on the North Side of Mount Munko Sardik:

This, on the whole, is larger than the one described above. It is about 1 kilometer long and about 400 meters wide. Talus is deposited on its lower edge. In front of the talus are narrow, deep depressions and these cause small lakes to be formed from the water produced by melting ice.

3. Glacier Near the Headwaters of the Belaya River:

This is a hanging glacier with a length of about 3 kilometers. The area of the permanent snow field is 4 square kilometers. The snowline is 2,000-2,300 meters above the lower edge.

4. Others:

Possibly there are glaciers at the upper reaches of the Mulkhei and Olzait Rivers (54.5 N; 96.1 F). The present glacier east of the Sayanski Mountain Range is all that remains of a large, ancient glacier. It is impossible for troops to cross.

E. Forests

About 10 percent of this entire area is forested, the greater part being densely covered. In the mountains and valleys, there are many fallen trees which present a major obstacle to military movement. Trees become larger towards the interior. Conditions in the various districts are as follows:

1. Area East of Lake Baikal:

In the Yablonovy Mountain Range and Vitim Plateau region, broadleaf mountain varieties of trees are most conspicuous. There are also places where pine and larch trees are mixed in with the hardwoods. There are many places where operational movements are impossible.

In mountainous regions on the east bank of Lake Baikal as far as Ulan Ude and Barguzin contains a mixture of broadleaf and pine trees. Between Ulan Ude and Morgzon, in the mountain area along the railway line, there are many pine trees.

2. Area South of Lake Baikal:

In the Hamardaban Mountain Range region which extends south of the lake there are dense growths of red pine, Siberian pine, broadleaf mountain trees, and fir trees. There are many steep, narrow ravines, full of fallen trees. Troop movement is impossible in many places.

3. Sayanski Mountain System Area

Halfway up the slopes, the area is covered with fir and Siberian Pine. As one gets farther above sea level, the broadleaf varieties become sparse. Near the summits, there are exposed, frozen places on which only a very few trees or plants grow. There are many places not trod by man; the gorges are steep and narrow and there are many fallen trees, making troop movement almost impossible.

4. Area West of Lake Baikal:

The railway line and the Angara River basin and mountain area west of the lake are covered with wide stretches of pine; in higher elevations, there are broad areas of fir and siberian pine.

5. Area North of Lake Baikal (Mama, Chuya, Verkhanyaya Angara River basin and mountain areas):

6. The mountainous areas of the Kropotkin Mountain Range and the Patomskoye Vitimskaya Plateau are covered mainly with broadleaf trees. In the river basins, there are pine; on the exposed, frozen summits, only a few hardy trees grow. The plateau is generally flat, but there are many ravines with low-hanging cliffs. Troop movement is not easy.

6. Mountain Area in the Upper Reaches of the Lena River:
Trees are mostly broadleaf. Pine trees are found here and there.

7. Central Siberian Plateau:
Dense, broadleaf forests cover a wide expanse of this area. There is also a mixture of red pine, Siberian pine, etc. There are few larches.

F. Arable Areas and Grasslands

Distribution is limited. They exist mainly in the principal river valleys and along railroad lines. Climate is continental and there is a long, cold spell with little snow or rain. During the spring growing season, there are many early droughts. During the harvesting season, there is too much rain, etc., which is disastrous for agriculture.

1. Cultivated Land:
In Buryat-Mongolian ASSR, it lies mostly south of the railway line and is limited to the low bottom lands of the Selenga River and its tributaries, the Chikei and Khilok and in the Barguzin River basin.

In the plains area along the railway line in Irkutsk Oblast, mainly wheat and flax are cultivated. In recent years, this area has gradually been extended north.

In Outer Mongolia, there are cultivated areas in the Selenga River basin and the Orkhon River valley. These areas occupy about 45 percent of the cultivated area in Outer Mongolian ASSR. Wheat, barley, rye, and oats are grown. Besides these, vegetables are grown in Ulan Bator and Altan Bulak.

2. Grasslands:
In the middle reaches of the Selenga River and its tributaries, the Jida, Chikei, Khilok and Uda Rivers (of Buryat-Mongolian ASSR), there are dry, grassy plains dotted with larch and pine trees. In the plains along the middle reaches of the Barguzin River Valley, there are many places where there are pine forests and grasslands together.

The dry grasslands in Irkutsk Oblast are dotted with white birch, especially in the river valley of the Angara River from Irkutsk to Ust Uda, the river basins of its tributaries near Zima, Tulun, Nizhne Ujinsk, and in the vicinity of the Kansk Plains.

Part 3. TRANSPORTATION

## I. ROADS AND OPERATIONAL ROUTES

This area has few first-class roadways. The weather and climate are very severe, and great care must be exercised when moving large troop units, especially mechanized units.

The northern half is particularly characterized by a dense wilderness, and there are no modern roads or highways. The only existing routes are footpaths used as hunting paths by the people of the area.

The sections of this area which have a comparatively well-developed road network are the Selenga River Basin and the area to the east. The center of this region is Ulan Ude and Kiakhta. Furthermore, the road network is fairly well developed in the neighborhood of Irkutsk and Cheremkhovo.

The most important roadways generally follow the railroad. One can classify these into those that lead westward to central Siberia; those from Outer Mongolia to the eastern shore of Lake Baikal; and those from the railway line directly to the Angara and Lena Rivers.

NOTE: Lake Baikal intercepts the east-west traffic routes in this area. On the southern shore, there is only one road following the railroad line. Lake Baikal forms a bottleneck from the point of view of continental traffic. Consequently, transportation on Lake Baikal itself must be considered in military operations.

A. Important Military Routes

1. From the Vicinity of Chita to the Shores of Lake Baikal:

a. Important military routes:

These are generally the roads which follow the railroad and can be conveniently used as supply routes.

(1) Chita-Sosnovo-Ozerskoye-Ulan Ude-Mysovsk-Kultuk Road (No 1)*, 782 kilometers long---Passable the year round; passable for troops, although the surface is not good; and there are some places that are difficult for motor vehicles during the rainy season.

(2) Ingoda-Khilok-Petrovsk-Ulan Ude Road, (No 2), 480 kilometers---The eastern half of it follows the railway track; the surface is bad; there are many swamps in the river valleys, and light wagons can barely pass along it. However, the section west of Khilok during the dry season permits the passage of vehicular traffic.

(3) Chita-Ulety-Yamarovka-Krasnychikoi Road (No 3), 504 kilometers---Although it is passable for troops between Tanga and Bilyutui, it is very narrow and in poor condition. For the passage of tanks, autos, and truck units, bridges must be built, and footpaths must be filled in.

*(TN: The following roads, Nos 1-35 are found on Map No 1, Part 1, and are herein referred to by numerical designation only.)

(4) Bukukun-Ashinga-Menza -Khilkotoi Road (No 4), 275 kilometers---Not limited to horses and, as it is the most important road to the Outer Mongolia area, attention must be paid to its future utilization and maintenance. The amount of fill-in material needed to widen the road which crosses valleys and streams would be very considerable.

b. Roads connecting with those listed above:

(1) Nogzon-Sosnovo-Ozerskoye Road (No 5), 95 kilometers---There are generally no obstacles to troop movements, but many marshes are formed during the rainly season, and continuous military vehicular traffic is difficult.

(2) Ulety-Nogzon Road (No 6), 65 kilometers--Pack wagons may pass during the dry season; in the rainly season, the surface becomes very poor.

(3) Bilyurui-Nogzon-Khilok Road (No 7), 54 kilometers---This road is passable the year round to military units.

(4) Tanga-Ingoda River Valley-Bukukun Road (No 8), 264 kilometers---This is a natural road suitable for horses (the southern half can hold drawn wagons); and permits a speed of not more than 2 kilometers per hour, or 18 kilometers per day.

(5) Menza-Krasnoye Road (No 9), 185 kilometers--Suitable for pack horses. To make it suitable for passage of motor and truck units, bridges must be built over the river valleys, and the road must be widened.

(6) Maleta-Krasnoye Road (No 10), 65 kilometers---Passable by infantry and cavalry units; to make it suitable for tanks and artillery units, it would be necessary to strengthen the bridges and to repair bad sections of the road.

(7) Poperechnoye-Petrovsk Road (No 11), 170 kilometers---Passable by vehicles in dry season, but, in the river valleys south of Innokentevska, swamps are found during the rainy and thaw season, and movement is impossible.

(8) Petrovsk-Khonkholoy-Mukhorshibir Road (No 12), 105 kilometers---Passable the year round; this is a good road permitting troop movements.

2. From Ulan Bator in Outer Mongolia, the So-Called Soviet-Mongolia Connecting Roads Leading to the Soviet-Owned Railway Line:

a. The Soviet-Mongolia connecting roads:

(1) Ulan Bator-Altan Bulak Road (No 13), new road, 356 kilometers---From Ulan Bator for about 100 kilometers north, the road is paved with asphalt. It is a good auto road and speeds of 35 to 40 kilometers per hour are possible.

(2) Ulan Bator-Altan Bulak Road (No 14), old road, 360 kilometers---Although there are no obstacles to motor traffic, the gradients are about 3/10. In the rainy season, tractor-drawn vehicles must be used. Speeds of 25-30 kilometers per hour are possible.

(3) Ulan Bator-Bulagan Kan-Khatkhyl Road (No 15), 700 kilometers---A natural road over which traffic is frequent. It is passable the year round, and there are no obstacles to automobiles. However, at the ferry points across the Selenga and Orkhon Rivers, bridges are necessary.
The road south of Lake Kosogol crosses broken land and has many steep grades. This road is very difficult to travel upon. The road, compared to the water route by way of Lake Kosogol, is only 30-80 kilometers longer, but traffic over the road must make use of horses. It is a very restricted roadway.

(4) Kiakhta-Okinoklyuch-Bichura-Maleta-Petrovsk Road (No 16), 204 kilometers---Passable the year round, and, although open to military traffic, bridges must be strengthened in one section to allow the passage of tanks and motor vehicles.

(5) Kiakhta-Novoselenginsk-Ulan Ude Road (No 17), 225 kilometers---Called the Mongolian Highroad. Passable the year round to military traffic.

b. Other roads:

(1) Kiakhta-Ust Kiakhta-Mysovsk Road (No 18), 304 kilometers---Passable the year round; open to auto traffic, but several bridges have collapsed and must be rebuilt.

(2) Kiakhta-Kiran-Tarbagatai-Ulan Ude Road (No 19), 285 kilometers--Passable the year round; open to autos, but, to allow tanks to pass, it is necessary to build bridges at the ferry points across the Selenga, Chikoi, and Khilok Rivers. The existing bridges must be strengthened.

(3) Malaya Kudara-Bichura-Tarbagatai-Ulan Ude Road (No 20), 262 kilometers---Open the year round to military traffic.

(4) Ust Kiakhta-Jida River Valley-Jida Road (No 21), 266 kilometers---Open the year round; passable by autos; and wagons can move off the main surface of the road.

3. Roads from Railway Lines Leading to Tsipikan and Barguzinу Area:

a. Chita-Romonovskoe-Tsipikan Road (No 22), 390 kilometers---Between Chita and Yendongin, vehicular traffic is possible during the summer. To the north, however, it is a wagon road; and, during the winter, there is a considerable amount of snow, and sleds must be used.

NOTE: Between Tsipikan-Barguzinу, it is a mountainous road only 3-4 meters wide. During the summer, wagons can pass, but, in winter, sleds must be used.

b. Ulan Ude-Barguzin-Mogait Road (No 23), 390 kilometers---During the dry season, cars may pass; but, during the rainy season, swamps form, preventing the passage of cars.....The Third Five Year Plan provided for the extension of the road network, the building of bridges, the repair of drainage ditches, basic improvements in the building of important sections of roads, the planning of good connections between railroad lines and the central areas of other oblasts in the north, etc., and great improvements have been shown.

4. Important Roads and Operational Routes:

a. Irkutsk-Cheremkhovo-Tulun-Taishet Road (No 32), 663 kilometers---Passable the year round; no obstacle to military traffic.

b. Irkutsk-Kachug-Zhigalovo Road (No 27), 360 kilometers---The main route joining the Lena River water route and the railway; is in very good condition; and passable the year round to all types of military traffic.

c. Tulun-Bratsk-Mamyr-Ilimsk-Ust Kut Road (No 31), 500 kilometers---Autos can usually pass along this road, but details are not known. (1935 edition, 1/1,680,000 map)

5. Other Roads:

a. Irkutsk-Ust Orda-Verkholensk Road (No 28), 230 kilometers---No obstacles to auto traffic.

b. Irkutsk-Angara River right bank-Malyshevka-Zhigalovo Road (No 29), 370 kilometers---Passable the year round to autos. From Irkutsk to the vicinity of Bokhan, they are strengthening the road with gravel.

c. Buret-Bokhan-Khogot Road (No 30), 200 kilometers--Auto facilities are being built under the Third Five Year Plan.

d. Nizhne Udinsk-Alygdzher Road (No 33), 200 kilometers---Light-surfaced road; details unknown; vehicles can pass in dry season.

e. Vitim-Mama-Bodaibo Road (No 34),-----Cars can pass during the dry season; but travel is impossible in the rainy season and during the thaw.

f. Kirensk-Vitim-Yakutsk Road (No 35), --A new (national) auto highway has been built along the Lena River to Yakutsk. From Irkutsk, it uses the Lena River waterway, and, from Yakutsk, cars are used. Details are not known.

Besides these, the Third Five Year Plan provides for the construction of highways joining the railway between Cheremkhovo and Golumet, Zalari and Nukuty, Zalari and Tagna, and Tulun and Irei (according to the Russian 1935 map, scale 1/1,680,000).

## II. RAILWAY AND WATER TRANSPORTATION

### A. Railways

1. History of Their Development:

The Siberian Railway construction began in 1892, having first been set forth in 1869 in the plan of Waruschov, administrator of Siberia. The construction has since undergone many changes. The railroad was begun at Chelyabinsk and, in 1896, it reached the banks of Lake Baikal and Baikal station. The very difficult task of building a detour around Lake Baikal was postponed. In 1900 work was begun from Mysovaya on the opposite bank to Sretensk, and was completed the same year. In 1904, the Lake Baikal detour was finished, and, at the time of the Russo-Japanese war, was the only transportation route in the area and of tremendous value. Until recently, a good deal of work was done to improve it.

2. History of Jurisdiction:

The area west of Baikal station on the shore of the lake and east of the East Siberian Railway was under the jurisdiction of the Transbaikal Railway. In 1936, however, it was reorganized, and the sections between Taishet-Petrovsk and between the East Siberian Railway and Ksenyevskaya were called the Molotov Railway. In October 1942, it was again reorganized as the Transbaikal Railway.

3. Construction Years:

| Termini | Date Started | Date finished |
|---|---|---|
| Ob-Irkutsk | 1893 | 1898 |
| Irkutsk-Baikal | 1896 | 1898 |
| Baikal-Mysovaya | 1899 | 1904 |
| Mysovaya-Sretensk | 1895 | 1900 |
| Navshinski branch line | 1938 | 1939 |

Work was started on the double tracking of the Siberian Railway main line immediately after the Russo-Japanese War and, in 1912, was finished as far as Karymskoye.

4. Value of the Railroad from a Military-Economic Viewpoint: Between Taishet and Chita is a section of the Siberian Railway which connects European and Eastern USSR. This section is the sole lifeline for the supply of the Soviet Far Eastern Army and for the development of industry. The branchline to Outer Mongolia is the main line of communication for the Soviet army in Mongolia, and, hence, its importance cannot be overemphasized.

In this area, the yearly production of coal amounts to 5,000,000 tons in the Cheremkhovo coal fields.

The Angara industrial area is the main reason for the building of a railroad to connect Irkutsk-Usole-Cheremkhovo. It is now under construction. Ulan Ude, Kultuk and Borzya on the Manchouli branch line, the import route from Outer Mongolia, have a yearly production of 2,000,000 tons of livestock and hides.

5. Construction of Branch Lines:

The branch line which branches off from Zaujinski, going around the western side of Lake Gusinoe to Kultuk on the Soviet-Mongolian Border, was completed in February, 1939, but the line is being extended and will eventually enter Outer Mongolia. It will pass through Altan Bulak to the capital of Outer Mongolia, Ulan Bator. Since the outbreak of the German-Russian War, however, work has almost ceased. A line was built to connect with the branch line around Lake Baikal which connects Irkutsk and Kultuk. It is planned to extend this line and build towards the Khatkhyl area on the shores of Lake Kosogol in Outer Mongolia. It appears that there has been some delay, but no details are known.

6. Construction of the Baikal-Amur Railway:

While the Lena main line which branches off from Taishet and then passes through Ust Kut to the Kirensk area was under construction, its development was continually influenced by changes in the political status of Manchuria and by changing political conditions in the east. Its plans were constantly being revised. It was planned to come out on the north shore of Lake Baikal from Ust Kut, meet the Siberian main line, and run east to Sovetskaya Gavan. Due to the German-Russian War, work has been stopped on it. Before the war, the stretch between Bratskoye and Taishet was open for traffic.

7. Special Note on the Railway Lines:

a. Between Chita and Slyudyanka:

In the vicinity of Yablonovaya and Kizha, the line crosses the Buryat Plateau. Its steepest gradient is 17.4/1,000. There are many dangerous curves. There are no large bridges, except for the one over the Selenga River, but, west of Mysovaya and facing Lake Baikal, there are many bridges over swamps and along the lakeshores.

b. Between Slyudyanka and Irkutsk, the detour round Lake Baikal passes close by towering mountains. The railway follows the mountain range on the north side of the lake, passing through many tunnels. The waves of the lake wash against the winding track. Cliffs rise on one side, and landslides destroy and bury the tracks, causing serious obstacles to train movements.

c. Between Irkutsk and Taishet:

This is the so-called Siberian Plateau region. There are many ridges, gorges, and turns, as well as many places which form very narrow defiles and affect the passage of trains. Forests cover a wide area. Over rivers such as the Ob and Uda, there are large bridges.

d. Along the main line there are areas of perpetually frozen earth. In winter, the temperature falls 50 degrees below zero, and rails often break.

8. Transportation Capacity:

| Section | At Present | Maximum Number of Trains that can be Accommodated with Additional Facilities | Tonnage Carried by One Train |
|---|---|---|---|
| Taishet-Irkutsk | 40 | 45 | 680 tons |
| Irkutsk-Chita | 44 | 49 | 680 tons |
| Naushinski branch line | 13 | 15 | 500 tons |

NOTE: In extremely cold weather, the amount of available transportation decreases by about 20 percent. Due to the operational characteristics of this area and the decrease during extremely cold weather, the amount of available transportation is about 70 percent.

9. Capacity to Repair Rolling Stock:

a. There are car shops in Ulan Ude and Chita, the former having a large capacity and capable of repairing and constructing locomotives and cars. The Chita shops are medium-sized and capable of only repairing locomotives and cars.

b. Repair shops:

There are 11 of these, each capable of handling about ten cars.

c. There are 12 roundhouses with repair facilities. After the outbreak of the Russo-German War, the ability to carry out repairs was rapidly reduced, because of the difficulty in obtaining repair materials and skilled repairmen.

10. Objectives Regarding Destruction and Damage:

a. Although blasting is a good method for destroying bridges, you must destroy both tracks of a double-track line to be successful. Bridges may be long, large and high. It is advisable to select for demolition purposes the sections of bridge where the supports are large and the current is swift. The bridges over the Jida, Selenga, Oka, and the Uda Rivers are of this type. Furthermore, on double-track lines, the tracks are well separated from each other, a fact one must consider.

b. In the case of destroying tracks, it is advisable to select those sections where there are steep slopes, sharp curves, or cutaway embankments, etc. In the case of rivers and marshland shorelines, there are many hills which tower up sharply and usually have many cutaway embankments. All of these locations are excellent for demolition work, as are the narrow roadbeds which have been built across swamplands. These locations are in the vicinity of Yablonovy and Kizha, where the rail lines cross the mountains, and along the detour rail line around Lake Baikal.

c. Blasting of water towers and the destruction of pumping plants and water mains are very effective. However, to achieve any real success, the destruction of water supply must be thorough and complete over a range of 100 kilometers.

d. Demolition of train tunnels is very effective, especially if the train can be caused to overturn and be destroyed inside the tunnel itself.

e. Marshalling yards should be destroyed, as well as generator plants, repair and manufacturing shops, turntables, signals systems, etc. It is also effective to wreck trains in narrow defiles.

f. It is effective to destroy communication facilities, but, since these are easily restored, it is advisable to destroy communication and transmitting stations.

B. Water Transportation

1. Summary

a. The most important areas which may be used for water transport are Lake Baikal and the Angara, Selenga and Lena Rivers. They flow through sections in which the winter season is very severe and the navigation season very short; consequently, their value as waterways falls off considerably. The economic development of the area is not very great. The natural features of the area are as follows:

(1) Long period of freeze (navigation possible for 5 or 6 months)
(2) Depth of water is not great, considering the amount of surface area (except for Lake Baikal)
(3) Great rise and fall of water during the summer (except Lake Baikal)
(4) These rivers flow through the center of several states (oblasts)
(5) Navigation on Lake Baikal is not reliable, due to frequent gales.

b. Administration of transportation and waterways on important rivers (lakes):

(1) Transportation service:

People's Commissariat for River Boats

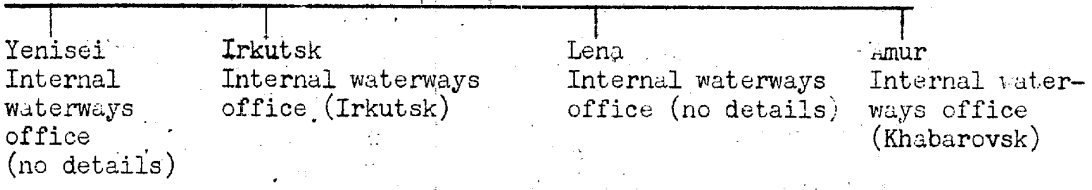
Administration Office for River Transportation

| | | | | |
|---|---|---|---|---|
| Yenisei | Lena | Angara shipping office (Irkutsk) | Baikal and Selenga Shipping office (Ulan Ude) | Upper and lower Amur |

omitted

(2) Waterways service:
People's Commissariat for River Shipping

Central Administration Office for Internal Waterways




NOTE: It is not certain, but it is believed that the Baikal and Selenga Rivers Internal Waterways Administration comes under the jurisdiction of the Irkutsk Internal Waterways Office.

c. Summary of current shipping on the important rivers (lakes), estimated as of 1943:

Current Shipping On Important Rivers and Lakes
(1943 Estimate)

| River | Passenger Freighter | | Tugs and Passenger Tugs | | Ordinary Barges | | | Oilers | | | Passenger Ships |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | No of Ships | Tonnage | No of Ships | Horsepower | No of Ships | Capacity (tons) Total | Capacity (tons) Avg | No of Ships | Capacity (tons) Total | Capacity (tons) Avg | |
| Selenga River | 1 | | 21 | 150-250 hp, with few exceptions | 47 | 12,455 | 265 | 3 | 700 | 233 | XX |
| Lake Baikal | 2 | | 6 | Unknown | 5 | 5,000 | 1,000 | X | X | X | X |
| Hivgara River | 4 | | 15 | Approx 400 | 21 | 15,330 | 730 | 3 | 2,130 | 710 | X |
| Lena River | 6 | | 101 | 1938 avg, 215 hp; later supplemented by 300 hp, resulting in a final 250 hp | 273 | 101,010 | 370 | 2 | 800 | 400 | Freight capacity, 120-150 tons; 1,400-1,500 passengers |

2. Evaluation and Special Characteristics of Important Rivers and Lakes:

a. Lake Baikal:

| | | |
|---|---|---|
| Elevation | : | 453 meters above sea level |
| Area | : | 31,500 square kilometers |
| Depth | : | 700-1,741 meters (increase from southwest to northeast; world's deepest) |
| Bottom | : | Mud and rock |
| Islands | : | 16; most famous in Olkhon Island |

The coastline has many indentations, and, with the exception of the vicinity of the western Baikal railway, the cliffs along the shoreline rise to a height of 1,400 meters above the lake.

The effect of the weather is very great for there are frequent gales up to 400 meters per second which are dangerous to shipping. Northwest winds are frequent in the southern sections during May and June.

Southwest winds are frequent in southern section during August.

Northwest and north-northwest winds distinguish the western shore.

Shipping on this lake is controlled by the Baikal and Selenga Shipping Office. The important ship routes are those between Baikal-Selenga River mouth and Barguzin-Nizhne Angarsk. Transportation capacity is unknown and, used mainly for civilian transportation its military value is slight.

b. The Selenga River is used for transportation from the Irkutsk area to Outer Mongolia, and from the road which connects the Siberian Railway and the Kyakhta to the Outer Mongolia area. As an auxiliary route to the recently opened Naushinski branch line, it is used for the transportation of wood pulp and lumber, cereals, cement, gasoline, etc. It has little military value.

There are shipping facilities up to Ust Kyakhta, but, below Ulan Ude, there are many shoals which form a great obstacle to navigation. Between the border and Ulan Ude the river is navigable by:

500-800-ton-class passenger boats,
250-300-ton tugs and
400-ton and smaller barges.

In the vicinity of Ulan Ude, the freeze lasts from early November to the end of April, allowing approximately 170 days of possible navigation.

It is estimated that, in 1943, the amount of freight carried will be about 750,000 tons.

c. Angara River

It can be used for a distance of about 650 kilometers between Irkutsk and Bratsk. It connects with the auto route from Ust Kut to Bratsk in the upper reaches of the Lena River. It is valuable as an auxiliary supply route for eastern USSR, depending on the Lena River route from the Transbaikal area. As progress is made in the construction of the Bamu Railroad east of Taishet, its value will decrease.

Boats can use this route for an average of 180 days a year. It appears to be limited to the transportation of coal and ordinary civilian cargo, although the capacity is not known.

NOTE: Between Irkutsk and Lake Baikal, there are many rapids. This part of the river was impossible to use in the past, but it appears to be useable now (extent of development unknown).

d. Lena River:

This river is an important transportation route is navigable from its mouth at the Arctic Ocean via Yakutsk to its upper reaches. It connects with the Siberian Railway. From Ust Kut on its upper reaches to Taishet and Irkutsk, and from Yakutsk to Tynda and Bolshoyneverreka, there is an auto road which forms a rear-area supply route from the Arctic Ocean and the Baikal areas to the Soviet-Manchuria border area. Recently, along with the development of the US-Russian northern air route, the value of this route is increasing greatly as a route for the development of bases, especially the Yakutsk base.

This route is being utilized for the transportation of material in and out of Yakutsk, as a connection with the gold-producing areas of Aldan and Bodaibo, and for the transportation of coal to Tiksi, a supply base for the Arctic Ocean air route.

The materials transported to Yakutsk, ASSR, consist of wood, coal, gasoline, cereals (including food and animal feed), as well as ordinary civilian goods. Furthermore, if the Bamu Railway from Bratsk to Ust Kut is put in operation, the material transported by water from Western Baikal to Yakutsk will be about 1,070,000 tons a year.

The Vitim River (tributary of the Lena River) is also used between Vitim and Bodaibo. Transportation on it is controlled by the Lena Gold-mining Office, shipping section at Bodaibo and its capacity is not large.

## III. MOTOR AND REGIONAL TRANSPORTATION FACILITIES

A. Automobiles

1. Number of Cars:

Motor transport has greatly increased in recent years. After the outbreak of the Russo-German War, however, there was no increase of motor transport, because many cars were withdrawn for use on the western front.

A fairly reliable estimation of motor transport in Buryat-Mongolian ASSR and Irkutsk Oblast is given below:

| Area | Trucks | Autos | Buses | Special Cars |
|---|---|---|---|---|
| Buryat ASSR and Irkutsk Oblast | 10,000 | 18,000 | 300 | 500 |
| Outer Mongolia | 1,300 | Unknown | Unknown | 70 |

2. Transportation Capacity:

As an average, one truck can carry a 2.5-ton load at a speed of 15 kilometers per hour and can travel 120 kilometers per day. However, trucks using synthetic fuel are able to carry only 70 percent of the aforementioned load and can travel only 65 percent as far in 1 day.

3. Supply and Repairs:

There are no manufacturing plants in this area; all supplies and finished products come from Western USSR. There are many small plants for the manufacture and repair of spare parts for cars, trucks, and combines. However, these were converted to war plants after the outbreak of the war.

In Chita, there are seven factories in addition to the Chita number-one, auto-repair plant; and, in Ulan Ude there are six factories.

In Irkutsk, there are approximately 16 factories, besides the large repair shops. These factories are second only to those in Moscow and Leningrad.

In Ulan Bator, there are medium-sized repair plants.

All of the above repair plants make auto spare parts, but their productive capacity is not known.

4. Synthetic Fuel:

Because of the shortage of gasoline after the outbreak of the Russo-German War, all but military vehicles use synthetic fuel. This is especially true in this area which is rich in the raw materials used in the making of synthetic fuels. Charcoal and coal are also used.

B. Regional Transportation Facilities

1. The number of Sleds and Wagons in Use:

A great number of sleds and wagons are taken over by the army after the outbreak of the Russo-German War, but there are many still remaining in the agricultural villages. However, these are becoming scarce and increased use of horsecarts and horse-drawn sleds is being made.

The following is estimated to be the number of horse-drawn sleds and wagons:

| | |
|---|---|
| Wagons | 25,000 |
| Sleds | 14,000 |

In eastern Outer Mongolia, nearly every house has a horse and wagon, and it is believed that there are approximately 22,000.

2. Transportation Capacity:

An average wagon can carry about 300-500 kilograms and can travel about 30 kilometers per day. During the freeze, the load can be increased approximately 20 percent.

An average sled can carry about 300 kilograms and can travel about 25 kilometers per day. This, of course, is in the winter period only.

Capacity and Speed of Wagons and Sleds

| Type | No of horses | Load (kgs) | Speed |
|---|---|---|---|
| Wagon | 2 | 350-500 | 8 km per hour |
| Sled | 1-2 | 300 | 6 km per hour |

| Road | Chita-Sosnovo-Ozernoye-Ulan Ude | Ingoda-Khilok-Petrovsk-Ulan Ude | Mogzon-Sosnovo-Ozerskoye | Chita Ulety-Yamarovka-Krasnychikoi | Bukukun-Ashinga-Menza-Khilkotoi | Ulety-Mogzon |
|---|---|---|---|---|---|---|
| Length (kms) | 442 | 480 | 95 | 504 | 275 | 65 |
| Passable to | Automobiles | Wagons | Automobiles | Automobiles | Pack horses | Wagons |
| Width (ms) | 6 | — | 6 | 6-8 west of Tanga 2 in some places | 1-5 | Below 3 |
| Type of Road | Sand with scattered pebbles, generally firm | — | Sandy, drainage on both sides | Sandy clay, but black earth in low places and rocky in mountain districts | Sandy clay, mountain passes rocky | Road surface becomes weak during rains. |
| Effect of Weather | Moderate | Great | Moderate | Great | Great | Great |
| Bridges | About 204 large and small bridges, passable | | Newly constructed wooden bridges at many places; strong and solid | Bridge foundations require strengthening for passage of tanks. | There is a wooden bridge in the vicinity of Menza which requires strengthening. | — |
| Ferries and Fords | Illegible | | — | Three ferry stations on the Ingoda river, but no traffic | To ferry station, fording places all along the river | — |





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| Obstacles | Sandy area east of Kulskaya, marshes in the Beklemishevo | — | When it rains, there are swampy places along the banks of the rivers and streams | Sandy area west of Doronino and marshy patches in the Ingoda River valley; steep roads through the Malkhanski Mts. | In vicinity of the mountain pass, scattered patches of swampy, river-valley earth with many fallen rocks tree | — |
|---|---|---|---|---|---|---|
| Conditions in the Off-Road Movements | Impossible for armored units | — | -- | Movements of armored units restricted or impossible in some places | Operation Impossible | -- |
| People | Russian Farmers and stockbreeders | -- | Russians | Illegible | Russians | None |
| Notes | Water and fuel supply available | Passable between Pekrovsk and Ulan Ude in dry weather | After heavy rains, it is difficult for heavy vehicles to pass | Illegible | Possible to replenish water and fuel | Possible to replensih water and fuel |

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SECRET

| Road | Khangin-Irkut River Valley-Kultuk-Irkutsk | Irkutsk-Kachug Zhigalovo | Irkutsk-Ust Orda-Verkholensk | Irkutsk-Angara Right River Bank Malyshoevka Zhigalovo | Buret-Bokhan-Khogot |
|---|---|---|---|---|---|
| Length (kms) | 315 | 360 | 230 | 370 | 200 |
| Passable to | Automobiles | Automobiles | Automobiles | Automobiles | Automobiles |
| Width (ms) | 8-9 | 12-13 | | 6-7 | |
| Type Read | Has drainage ditch. Paved with gravel; firm road. | Sandy, clay; hard surface | | Sandy, clay; firm with gravel from Irkutsk to Bokhan | |
| Effect of Weather | Moderate | Moderate | Moderate | Moderate | |
| Bridges | All strong wooden bridges; no obstruction to passage of auto | | | | |
| Ferries and Fords | | | | | |
| Obstacles | Gradient of 20 degrees on the Zaluimkhavo Pass and the Shaman Pass west of Kultuk; marshes west of Turan | | | | |
| People | Russians and Buryat farmers and stock breeders | | | | |
| Conditions in re Off Road Movements | Forces have freedom of action on level ground, but this is impossible at some places. | To travel from Irkutsk to Kachug takes 1-1½ days on the national road (by auto). | | | |
| Notes | Water and fuel supply available | | | | |





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| Road | Ulan Bator Altan-Bulak (New) | Ulan Bator Altan-Bulak (Old) | Ulan Bator-Bulagan Kan-Khatkhyl |
|---|---|---|---|
| Length (Kms) | 356 | 360 | 700 |
| Passable to | Automobiles | Automobiles | Automobiles |
| Width (ms) | 12-15 | 3-4 | 3-5 |
| Type of Road | Asphalt from Ulan Bator to 101 kms north (paved) | Sandy and Clayey soil | Sandy and Clayey soil |
| Effect of Weather | Slight | Moderate | Slight |
| Bridges | Strong bridges; no obstacles | Bridge capacity, 5 tons and under; several bridges damaged | No large bridges |
| Ferries and Fords | | | Ferries on the Olkhan and Selenga Rivers; other rivers fordable at normal water level |
| Obstacles | | There are steep mountain passes and swampy shoreline area | Mountain passes and fords |
| People | | Very few inhabited areas | Comparatively large number of Khalkha Mongolians in the river valleys. |
| Conditions in re Off-Road Movements | Auto speed 35 kms/hr | Auto speed 23-30 kms/hr | |
| Notes | Fuel and Water Available | Communication lines along the road | |

| Road | Tulun-Bratsk-Mamyr-Ilimsk-Ust Kut | Road following Ry lines: Irkutsk-Jida-Tulun-Taishet | Nizhne Udinsk-Alygdzher | Vitim-Mama-Bodaibo | Kirensk-Vitim Yakutsk Road right bank of Lena River | |
|---|---|---|---|---|---|---|
| Length (kms) | 500 | 621 | 200 | 260 | | |
| Passable to | Automobiles | Automobiles | Automobiles (large) | Automobiles (large) | Automobiles (large) | |
| Road | Bilyurni-Nogzon Khilok | Tanga-Ingoda River valley Bukukun | Menza-Krasnoye | Maleta-Krasnaye | Pomerechnoye-Petrovsk | Petrovsk-Khonkholoy Mukhorshibir |
| Length (kms) | 54 | 264 | 185 | 65 | 170 | 105 |
| Passable to | Automobiles | Pack horses | Pack horses | Pack horses | Automobiles | Automobiles |
| Type of Road | Road surface in good condition; drainage water ways on both sides | A small, narrow hunters trail | Sandy clay; exposed rocks and tree roots in the vicinity of the mountain passes | Sandy and rocky | Sandy; road surface is hard and firm | Sandy |
| Effect of Weather | Slight | Great | Moderate | Moderate | Great | Slight |
| Bridges | Bridge material good; load limit, 10-12 tons | Bridges not good; will hold only horse - drawn wagons | Almost no bridges | Most bridges have been repaired; load limit, 5 tons | Almost no bridges | All wooden bridges have been repaired; load limit, 10 tons. |
| Width (ms) | 5-7 | --- | 1.5 or less | 3 | --- | 5 or less |

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| Ferries and Fords | | Easily forded at all places when river is at normal level | Rivers along the route are easily forded | | | Rivers along the route are easily forded |
|---|---|---|---|---|---|---|
| Obstacles | Sandy between Bilchir and Shakagorkhonulus | Vicinity of Novopavloskoe are mountain passes; and swamps in river valleys | Swamps in the vicinity of Innokentevka | Mountain passes (slope of 20 degrees or less) | Swamps in the vicinity of Innokentevka | None |
| People | Buryats, Russians and Tatars--farmers | Russian farmers and hunters | Buryat stockbreeders | Few inhabited areas; peopled by Russian farmers | Buryat stockbreeders | Russian farmers |
| Conditions in re Off-Road Movements | Except on the roads, the forests (make operations troublesome) | Operations are difficult off the roads and impossible in places | Except for one swampy belt, operations are easy. | Because of the steep slopes in forests, operations off the road are difficult. | With the exception of one swampy district, operations off the road are easy. | Transit possible, except in Khonkoloy-Mukhorshibir district |
| Notes | | Water and fuel are available | Water and fuel are available | -- | Water and fuel are available | |

| Road | Okinoklyuch-Kiaknta-Bichura-Maleta-Petrovsk | Kiakhta-Novose-lenginsk-Ulan Ude | Kiakhta-Ust Kiakhta-Mysovsk | Kiakhta-Kiran Tarbagatai-Ulan Ude | Malaya Kudara-Bichura-Tarbagatai-Ulan Ude |
|---|---|---|---|---|---|
| Length (kms) | 240 | 225 | 304 | 285 | 262 |
| Passable to | Automobiles | Automobiles | Automobiles | Automobiles | Automobiles |
| Width (ms) | 4-6 | 8-10 | 3-4 | 4 | 4-60 |
| Type of road | Sandy road surface; many pot holes | Paved with gravel | River basin of broken stone and clay, mixed with sand; sandy mud | Sandy | Sandy soil; road surface of broken rock |
| Effect of weather | Moderate | Slight | Moderate | Moderate | Moderate |
| Bridges | Some must be reinforced for passage of tanks, heavy cars, and mechanized units | Good quality; load limit, 12 tons | Some bridge structure has been destroyed and need repairs. | Some places must be reinforced for passage of tanks, heavy cars, and mechanized units | All bridges are wooden. Medium tanks can pass but one part must be strengthened for artillery. |
| Ferries and Fords | Two ferry places, load, 2-3 tons; eight dry fording places where autos can cross | Two ferry places; 10-25 tons and 60 tons | Four ferry places; most of them carry 2-3 ton loads | Two ferry places; load, 2-3 tons; eight dry fording places where autos can cross | Except for the Uda and Khilok Rivers, all can be crossed. Two ferry places; load, 5-7 tons. |
| Obstacles | | None | Mountain passes in vicinity of Zarubina and Ust Khiakhta; fords in the Alkati region of Lake Belos | The Akhul Mountain pass and sandy area south of Nizhne Zhirim | Sandy area near Sayantuy; swamp area near Shabartuy |

| | | | | | |
|---|---|---|---|---|---|
| People | Russian farmers | Russian and Buryat farmers and stock-breeders | Russian and Buryat farmers | Russian farmers | Russian farmers |
| Conditions in re Off-Road Movements | Generally impossible | Armored units can usually pass along the road, but there are a few obstacles | Armored units can generally use this road, but there are some obstacles. | Generally passable but all rivers, wooded areas, hills and slopes are difficult. | Difficulty in one area only; movement of armored units possible. |
| Notes | Water and fuel easily obtainable | Communication lines on the roadside | Replenishment of fuel and water possible | Replenishment of fuel and water possible | Replenishment of fuel and water possible. |





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| Road | Ust Kiakhta-Jida River Valley-Jida | Chita-Romanovskoy-Tsipikan | Ulan Ude Barguzin-Mogait | Sosnovo-Ozerskoye-Romanovskoye | Ulan Ude-Mysovaya Kultuk |
|---|---|---|---|---|---|
| Length (kms) | 260 | 390 | 390 | 110 | 340 |
| Passable to | Automobiles | (Wagons) (Autos) | Automobiles | Automobiles | Automobiles |
| Width (ms) | 3-4 | 6 | | | 3-6 |
| Type of Road | Sandy, hard road surface; gravel-paved road | Roadbeds is hard; drainage ditch | | First half is red earth; second half is gravel. Hard; no drainage ditch | Gravel, clay, earth |
| Effect of Weather | Slight | Moderate | Great | Moderate | Great |
| Bridges | There are strong wooden bridges. Autos can pass easily. | North of Yendon-gin, there are no bridges | | Wooden bridge; no obstruction for automobiles | Small bridges and many need repair |
| Ferries and Fords | | All small rivers can be crossed when water is at normal level. When water rises, traffic stops. | | | All rivers overflow in the rainy season, and crossing is often impossible |
| Obstacles | Mountain passes west of Modonkul and Torey | Yablonovy branch mountain range | | Becomes lighter in the Yeravnoye Lake group | Narrow mountain road south of Lake Tatarovo and Pai Lakes |
| People | Russian and Buryat farmers | | | Russian farmers | Russian farmers |
| Conditions in re Off-Road Movements | Wagons can move off the roads; | | | | There are many places where armored cars cannot travel away from the road |
| Notes | It is easy to replenish water and fuel supply. | | In rainy seasons, it is swampy in places and difficult for autos to pass. In winter, much snow piles up, and traffic of heavy vehicles stops. | | Generally no obstructions to supply of water and fuel |

## Part 4. COMMUNICATIONS AND AVIATION

### I. COMMUNICATIONS (INCLUDING RADIO)

A. Summary

1. The core of the communication system in this area is wire communication, but wireless communication has made conspicuous progress; moreover, if the main lines of wire communications, which are built along railways and serve military and ordinary needs, are intercepted, there is no alternative but to depend entirely upon wireless communications.

2. Control System of the Communication Networks:

From the standpoint of controls, the wire communication networks are classified as follows:

a. Communication networks used by railroads ..... under the Peoples Commissariat for Transportation

b. Communication networks used by the general public ..... under the Peoples Commissariat for Communications

c. Communication networks used for military or defensive purposes ..... under the Peoples Commissariat for Internal Affairs; in wartime, under the Peoples Commissariat for National Defense

3. Outline of Communication Facilities:

Trunklines are used for all communications in peacetime, but they are insufficient for wartime needs.

NOTE: When the Japanese and Manchurian conditions are compared with conditions along the Siberian Railways, results are as follows, supposing that Japanese communication systems are class "A", and Manchurian communications systems are class "B":

| Japan & Manchuria | Siberia |
|---|---|
| 1st class | Chita to Vladivostock along the Transbaikal Railway. |
| 2nd class | |
| 3rd class | Chita to west of Omsk between Chelyabinsk-Sverdlovsk. |
| 4th class | |

NOTE: (i) There is comparatively large number of communication circuits east of Chita. (Their capacity can be considered twice that of west of Chita.)

(ii) West of Chita, there is wireless to supplement wire communication, ie., there are transmitters and L-type antennas attached to main stations.

B. Wire Communications

1. The trunklines of wire communication form the main artery of communications in eastern USSR and these circuits are of three general classes--those for railroad, public, and military use. The conditions of communication networks and number of lines are similar to those on the foregoing chart.

NOTE: Number of circuits---
(Telegraph, one circuit on one line
(Telephone, one circuit on two lines

The distance between railroad and communication lines averages between 20 and 25 meters.

2. Long-distance communication via this area consists of a circuit which connects Moscow and Ha-erh-pin (Harbin). With telephone and telegraph, it relays radio broadcast to the principal cities of Eastern USSR and transmits photographs. It is of great economic and military value.

a. In this area, the relay stations are located in the following places:

Chita
Khilok
Ulan Ude
Tankhoi
Irkutsk, Zima, Tulun

b. Four long-distance telegraph and telephone circuits are attached to the topmost crosspiece of the telegraph poles.

Long distance procedures are:

(1) Telegraph:
Radio audio cycles are automatically transmitted or keyed on telegraph circuits.

(2) Telephone:
It is relayed (repeated) by radio-carrier telephone circuit. It is said that the distance covered by direct telephone communication used by the railroads extends from Khabarovsk to Chits.

3. Communication Instruments:

a. Telegraphic instruments and hand-operated and automatic printing machines are used for the most part on main circuits. Morse keys and sounders are used on local circuits.

b. Telephone apparatus of the oscillating and Bell-telephone type is used. Telephone lines used for military and police purposes are of the multiple-line type and are extremely reliable. The telephone apparatus is estimated to be effective to a distance of 300-400 kilometers.

4. Cable lines are used locally for cities, factories and railroads, but the are not used on the main lines. Moreover, even though there are underground installations in the vicinity of important areas, as well as in the border areas, they are only local. The localities west of Chita where the lines have changed into the cable type are as follows:

Irkutsk---long-distance telephone only
Zima------for railroad use only

5. Destruction and Distrubance:

In order to cut off wire communication, it is necessary to destroy the telegraph and telephone relay stations of the cities which are important in the lines of communication. The important objectives within this area are as stated above.

C. Wireless Communications

1. Special communication systems, such as many ultra short-wave messages on one wave length, are used, as well as hand-sent messages, printed communications, teletype (JIDOTSUSHIN) messages and telephotos. As an auxiliary to the wire telegraph systems, large wireless stations have been built in the important cities of Siberia. These stations have been of great value, because they are used by industries in the are, as well as by military personnel and the government.

2. Wireless Telegraph:

Independent radio stations for high-speed communication, with improved receiving and sending equipment, have been set up for communications between main stations. The radio equipment used is exclusively short-wave and usually of the crystal-oscillator type.

The important stations of this area are listed below:

| Station | Power Output | No of Generators | Equipment | High-Speed Communications to these Stations | Low-Speed Communications to these Stations | Notes |
|---|---|---|---|---|---|---|
| Chita | 15 KW | 2 | | Irkutsk Yakutsk Nezametny Moscow (teleprinter) | More than ten stations | A teleprinter to Moscow is in operation. |
| | 1 KW | 2 | | | | |
| | Low Power | 6 | | | | |
| Irkutsk | 20 KW | 1 | Besides a telegraph and telephone, the station communicating with Moscow has teleprint and telephoto circuits | Moscow Vladivostok Khabarovsk Nagaevo Yakutsk Chita Bodaibo Sverdlovsk and others | Ten Stations | |
| | 15 KW | 4 | | | | |
| | 4 KW | 1 | | | | |
| | 2 KW | 1 | | | | |
| | 1 KW | 5 | | | | |
| | Low Power | 8 | | | | |

3. Wireless Telephone:

The radio telephones which link the important cities of Siberia and European Russia have recently been classified into sevon (EdN: sic) groups: the Moscow, Krasnoyarsk, Yakutsk, Irkutsk, Harbin and Ulan Ude lines, but these either ceased or curtailed operations after the commencement of the German war. At present, the communication stations in this area are those at Chita, Ulan Ude and Irkutsk.

D. Radio

The USSR radio industry is under the supervision of the National Radio Committee (Zen), which comes directly under the Supreme Soviet. Technical matters in connection with the management of the industry are dealt with by the People's Commissariat for Radio. The central organization is the Radio Bureau. Recently, there has been an increase in the number of high-power radio stations which are being used for propaganda and educational and technical studies. In Siberia, anti-Manchurian and Korean programs are broadcast, and there are a number of relay stations which enable people of all areas to listen to the broadcasts. The important radio stations in this area are at Chita, Ulan Ude, Irkutsk and Ulan Bator.

E. Postal Services

1. The mail service and the telegraph, telephone and wireless services are all controlled by the People's Commissariat of Communications. The administrative organization follows:

People's Commissariat of Communications
Oblast and Local Communication Control Offices
District and Urban Communication Service Offices — Urban and central post offices
Communications Agency — Local communication offices

NOTES: (i) Communication offices have been set up in the cities and centers of all districts. In addition to handling mail, telegraph, and telephone service, these offices supervise the local communication offices and agencies which are under their management.

(ii) The local communication offices handle mail, telegraph, and telephone services.

(iii) The communication agencies are generally small offices and handle mail only. (Among them there are some which handle telegraph and telephone services.)

2. These rules, extracted from the group of special wartime restrictions and put into effect July, 1940, are quite similar to those in Japan. The following are examples:

a. It is forbidden to mail sealed letters or documents containing chess problems, crossword puzzles, braille for use of blind people, and picture postcards or postcards with photographs attached to them.

b. It is forbidden to use double envelopes.

c. International mail must be mailed at the post office by the sender himself.

d. The contents of sealed letters shall not exceed the fixed rate of four pages each. (However, this restriction does not apply to letters from state organizations.)

e. The weight of small packages shall be less than 3 kilograms. (It is reported that, in some districts, the handling of packages is periodically discontinued.)

## II. AVIATION

A. This study has not been completed and is not altogether accurate however, the present estimation of conditions is as follows:

1. Disposition of Airfields:

There are about 55 airfields in all. They are distributed among three areas: one being the area of the railroad running to the east of Lake Baikal; the second area lying to the south of the railroad running west of Lake Baikal (including the railroad); and the third area being to the north of the western railroad (not including the railroad).

a. The area to the south of the railroad east of Lake Baikal has about 30 airfields. These are mainly intermediate fields and are located in the neighborhood of the railroads and important river valleys. There are many military fields which would be of great value as rear bases operating against Manchuria.

b. There are about ten fields in the area to the south of the railroad west of Lake Baikal. They are primarily located along the railroad tracks and are valuable, because they are on the main supply route.

c. The area north of the railroad is inconvenient for traffic, and fields are located primarily in important river valleys. They number about 20, and there are many civil seaplane bases. Their military value is slight, but, recently, the fields (such as that at Kirensk) have been used in the northern American-Russian air route for transporting materials to aid the Russians. These fields have also assumed great importance as intermediate bases.

2. Nature and Equipment:

The details are not clear, but the airfields in the district along the railroad tracks and the important airfields in Ulan Bator have excellent natural facilities, and the installations are generally complete. The airfields in the area north of the railroad, with the exception of the one at Kirensk, are not well equipped, and, at times, their use is considerably restricted.

Some airfields in the southern area have airplane hangars.

3. Fuel and Ammunition and Their Shipping:

Fuel and ammunition are manufactured in the districts surrounding the airfield. In the neighborhood of Chita, subterranean or semi-subterranean installations at the edge of forests are used as a defensive measure against anti-air attack, as well as ground attack.

The transportation of fuel and ammunition is made by railroad and highway, but, in the area to the north of the railroad (not including the railroad), great use is made of the Lena and Angara rivers.

Since both water and land transportation is difficult, it is presumed that more air transportation will be used.

## Part 5. CITIES, INHABITED AREAS, AND PEOPLE

### I. GENERAL SUMMARY

A. Distribution of Population

The population of this region is sparse, and, according to the estimate made in Jan 1942, the population of Irkutsk Oblast and Buryat-Mongolian ASSR was about 2,150,000, and the density was not more than 1.74 persons per square kilometer. Most of the people are concentrated along the railroads and important transportation arteries. Even though the large villages are located along the railroad track and are not far apart, they have a small number of houses.

The population of the cities makes up 44 percent of the total population. The agricultural population is very sparse, and there are very few people in the other areas. Year after year, the city population centers have grown larger, and, after the Second Five Year Plan, this trend became especially pronounced. Although the farming population showed a gradual increase during the 1926-32 period, there has actually been a decrease as a result of a decline in the birthrate of this group of people and a general movement of people to the cities in search of industrial employment.

Population Movement in Buryat-Mongolian ASSR

| | 1926 | 1932 | 1939 | 1942 |
|---|---|---|---|---|
| City Population | 41,900 | 69,700 | 163,400 | 277,789 |
| Agricultural Population | 348,100 | 347,100 | 378,700 | 352,118 |
| Total | 390,000 | 416,800 | 542,100 | 629,907 |

Population Movement in Irkutsk Oblast

| | 1926 | 1932 | 1939 | 1942 |
|---|---|---|---|---|
| City Population | | | 561,676 | 669,438 |
| Agricultural Population | | | 725,020 | 848,562 |
| Total | | | 1,286,696 | 1,518,000 |

Increase in Population of Important Cities

| City | 1926 | 1932 | 1939 |
|---|---|---|---|
| Ulan Ude | 28,918 | 55,007 | 129,417 |
| Kiakhta | 9,200 | 11,000 | 15,000 |
| Irkutsk | 108,129 | 141,300 | 243,380 |
| Cheremkhovo | 14,485 | 23,200 | 65,907 |
| Chita | 61,526 | 71,400 | 102,555 |

B. Special Characteristics of Inhabited Areas

1. It is characteristic of cities that they are well laid out, have broad avenues, have many plots of land with dwellings or shops and a lot of open land for development, and that the surrounding country is fenced off.

The buildings along the main highways are quite close together but there is a considerable amount of space around the principal buildings and churches.

Off the main highways, both sides of the streets are systematically divided into lots, which are surrounded by stockades or board fences.

The main building is in one corner, and the houses are very close together. In Chita, Ulan Ude, Irkutsk, and other comparatively large cities, many of the important buildings are made of brick or stone, and the walls are from 50-80 centimeters thick, giving them power to resist small-arms fire. The other buildings are nearly all of wood construction and are like buildings in the villages, except that they are larger and are equipped with brick foundations and basements. In the military camps, aside from the vast brick structures, the recent increase in building has been of wooden construction.

2. Villages usually have 40 to 50 buildings. The large villages contain 100 to 150 buildings. Those with 200 buildings or more are very scarce. The disposition of houses and arrangement of roads is such that there is plenty of free space and, generally there are no walls around the out skirts of the villages.

Although the villages state of development is not clear in the last 20 years, they have grown more than 20 percent, and the change in social organization has been great. New villages are being constructed to make the collective farms and state farms seem progressive, and a few public buildings have been added to the collective farms and state farms. Taking the farming villages as a whole, there has been no great change in their external appearance.

## II. PRINCIPAL CITIES AND TOWNS

### A. Petrovsk

The Transbaikal district was formerly a manufacturing area. Iron ore was mined from the surrounding area, and blast furnaces had a yearly capacity of 5,000 tons of pig iron. Using the iron foundries with these furnaces as their centers, great cities developed, and, recently, new metallurgical factories have been built. It is said that the production of steel ingots and other steel materials has increased to 80,000 tons per year. According to the 1926 census, the population has gradually increased. In the future, it will be the industrial center of this district. Its development is assured, and it will also be an important city from a military point of view, as well as from one of transportation.

### B. Bogdarin

This is an iron-mining village about 260 kilometers north of Chita, on the banks of the Maly Amalat River. Iron ore is mined in the neighboring valleys, and there are civil airfields in the vicinity which are well equipped. They have direct communications through Ulan Ude, and supplies are brought in by motor transport and horsecarts.

### C. Ulan Ude

This is the capital of Buryat-Mongolian ASSR. The population is 129,417 (in 1939). It lies at the junction of the Selenga and Uda Rivers. It occupies an important position in regard to the Outer Mongolian district of Ulan Bator and, since ancient times, has been a primary outlet for Outer Mongolia's foreign trade. Besides being the center of Buryat-Mongolian ASSR's politics and economy, it occupies a strategic military position.

D. Barguzin

Located on the Barguzin River, near the eastern shore of Lake Baikal, this is a city of more than 2,000 people (according to a 1941 Soviet Map). It is a river fishing and industry center and an important village in the northern section of Buryat-Mongolian ASSR. It is an important traffic center for trade going through Verkhne Angarsk and Tsipikan--the traffic from Ulan Ude coming by motor, and that from Ust Barguzin being more conveniently transported by water.

E. Kiakhta

This is an important traffic center on the border between the USSR and Mongolia. There are about 2,000 buildings and 15,000 people (1939). The inhabitants are, for the most part Russians and Buryats. It lies just across the border from the Outer Mongolian city of Altan Bulak.

F. Jida

This is a town in the Jida river valley, 225 kilometers west of the Jida railroad station which is on the Navshinki branch line, and, since 1932, it has developed rapidly because of the discovery of ore deposits there. From the neighboring river valley, they mine tungsten, molybdenum, coal, fluor spar, gold dust, and numerous other minerals. Among these, the tungsten production is the greatest in the USSR and is actually 65 percent of the country's entire production. The coal is of bituminous type, and it is reported that there are 100,000,000 tons buried there.

G. Irkutsk

This is a large city on the western bank of the Angara River near the southwest shore of Lake Baikal. It has a population of 243,380 (1939) and is a center for highways and air routes to Outer Mongolia, Ulyasutai in the south, and Bodaibo and Yakutak in the north. It is an important traffic hub--the military, governmental, and economic center of Eastern Siberia. Moreover, as a very important supply base for military operations in Eastern Russia and Trans-Siberia, it has rear area installations and is of great strategic importance.

H. Usole

Although this is only a small town on the Angara River, in recent years as a result of the progress in the Angara River Development, it has become a rising city and tends to become a center of heavy industry along with Irkutsk and Cheremkhovo.

NOTE: The Angara River Development is a plan (part of the Third Five Year Plan) to make the Irkutsk region the foremost heavy industrial center by developing the mining industries in the vicinity of Lake Baikal and using the water of the Angara River and the coal of the Cheremkhovo coal fields.

I. Cheremkhovo

It lies in the center of the third largest coal field in Russia, which extends for 500 kilometers northwest from Irkutsk to Nizhne Udinsk. At one time, it was the greatest coal-mining region in this area, but, recently, there has been a tendency for it to become the center of the heavy industrial section of Eastern Siberia along with Irkutsk and Usole because of the Angara River Development project. Now it is a fast-rising city. The population is 65,907 (1939).

J. Taishet

The population of this city is about 16,000 and is composed mainly of Russians. Formerly, it was just a small railroad station, but, in recent years, it has become the center of the Taishet district's 63 villages and has developed into a manufacturing and distributing area for hemp, lumber, and hides and especially as a junction for the Baikal-Amur Railroad. It is an important point from the standpoint of transportation.

K. Kachug

This port is located at the headwaters of the Lena River. It has shipyards under the administration of the Arctic Ocean Sea Routes Department, and civilian airfields. It has communication with Irkutsk via an excellent motor highway and, since it combines water and land transportation, it is an important traffic center. Here they receive supplies of fodder, construction lumber, etc., from the Irkutsk area via the highway and send them to the interior by way of the Lena waterway.

L. Nizhne Angarsk

This town is located near the mouth of the Verkhne Angara River at the extreme northern end of Lake Baikal. In 1938, it became a town and is the center of the river's fishing industry. As it is a port for Lake Baikal water transportation and will have the projected Baikal-Amur railroad line, it will become an important point connecting the Siberian Railroad and the Baikal waterway.

M. Bodaibo

This town is situated on the banks of the Vitim, a tributary of the Lena River, and has prospered because of the discovery and development of the gold-mining industry. For a long time, the Bodaibo gold-mining district has been known to have extensive buried deposits, and the history of its development is long. In recent years, however, they have electrified and improved the mining process. Water transportation is convenient from Irkutsk and Kachuga, which are among the USSR's gold-mining areas and have regular air communication by seaplane.

N. Altan Bulak

This is an important city on the Outer Mongolian northern border between the old capital of the Outer Mongolian province of Ulan Bator and the Soviet district of Ulan Ude, and is right across the border from the Soviet city of Kiakhta. It is the administrative center of Borugan Aimak* and the center of Soviet-Mongolian foreign trade, as well as an important traffic center. Recently, the development of light industry there has been noticed. The inhabitants are mostly Russians. There is communication four times a month by passenger-mail busses to Ulan-Bator.

O. Ulan-Bator

In 1646, a Buddhist temple was established here and the region gradually became prosperous. As the capital of the Mongolian republic, it is the military, governmental, economic, communication, transportation, and cultural center of the area.

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*(TN: An aimak is a minor administrative region of Outer Mongolia.)

P. Sukho Bator

This is a fast-growing city on the right bank of the Olkhon River, 2 kilometers upstream from its junction with the Selenga River. It has become a base of Russian-Mongolian foreign trade and an important point for communication between Ulan Bator and Botugan Aimak. Traffic with the Ust Kyakhta district is maintained by the use of 200-ton barge tugs. Provisions and the necessities of life are imported from Soviet Russia, and domestic animals and animal products are exported.

Q. Khatkhyl

This is a port located on the southern shore of Lake Kosogol. It is placed at an important point from the standpoint of foreign trade routes, which cross the lake and connect with the Soviet districts of Irkutsk and Kultuk. It has communication with Ulan-Bator once a month by a passenger-mail bus.

Part 6. BILLETS AND RATIONS

Except for the detour around Lake Baikal, the population is rather dense and supplies are comparatively abundant along the Siberian Railroad line. Although this is convenient for billeting and obtaining rations, as one gets farther away from the railroad, the population becomes increasingly scarce, and supplies almost nonexistent, so that almost no billeting facilities or rations are found.

## I. BILLETS

### A. Billeting Facilities and Number of Houses

1. Billeting Facilities:

Although there is some difference in billeting facilities resulting from the different type of house construction in the cities and villages, in villages there are approximately, facilities for one and a half times the population. In the important cities of Ulan Ude and Irkutsk and other cities such as Kiakhta, Usole, Cheremkhovo, Tulun, Petrovsk, etc., there are large buildings, and these may be used advantageously for mass billeting. Therefore, one may expect considerable billeting facilities. In the Outer Mongolia region, population is very sparse, and one cannot expect billeting in the houses available. One must rely solely on bivouacking.

2. Population and Number of Houses:

The total population of Irkutsk Oblast and Buryat ASSR is about 2,150,000. The density of population is about 1.78 persons to the square kilometer, and, in general, the inhabitants are grouped in areas along the railroad tracks and along the banks of important rivers (such as the Selenga and its tributaries and the basins of the Lena and Angara.) In other areas, the population is very sparse, and the number of dwellings is from about one third to one fifth the number of people.

### B. Construction of Houses

Construction differs according to the means of the population, and between city and village. The inhabitants of Outer Mongolia and the interior live in huts or tents, and rarely in permanent dwellings.

1. The average home is made of wood. Split logs are piled up sideways, with the chinks stuffed with moss and mud to make the outer walls. The same materials are often used to make the roof. All the population use a pechka stove for heating, and the houses are divided into two or three rooms.

2. The government offices, schools, hospitals, and other comparatively big buildings in the important cities are mostly constructed of brick with galvanized iron roofs.

3. The dwellings in the southern section of Buryat-Mongolian ASSR and in Outer Mongolia are the so-called "Mongolian huts," of which each family has one or two. They are constructed in the same way as they are in Inner Mongolia. The capacity of the large ones is 13 to 15 persons. In the wintertime, they place the heating unit in the middle of the hut, and this restricts the number of people it can hold to one half. However, as a rule, the Mongolian homes cannot provide spare room for billeting.

C. Water Supply

This region is almost entirely mountainous and abounds in small streams. There are also many springs, lakes, and other sources of water. The important transportation routes and inhabited areas are always on the banks of rivers, and, by using both the established wells and river water, there is usually no difficulty in obtaining water. The river water and well water is generally of excellent quality and in sufficient quantity.

However, there are no sources of water in the vicinity of the peaks of the Yablonovy and other mountain ranges, and, in many places, it is impossible to get at the water beneath the surface. Transported water is at a premium in these localities. In the wintertime, ice-breaking machines are needed on the rivers in order to get an adequate supply of water. Furthermore, in mountainous areas, the streams are small and shallow, and the water freezes to the bottom. It is necessary to make thorough preparations for transporting water. During extremely cold weather, it is very difficult to dig wells, and water supply becomes a problem. It is necessary to follow methods of obtaining water from ice and snow.

D. Fuel

1. This area is approximately 80 percent forest, and, since there are trees along almost all the communication lines, firewood for fuel in the barracks is always available. However, it is absolutely essential that the equipment for tree felling be carried, as, in many cases, large military units will have to do this work themselves. Since the inhabitants do not use charcoal, it cannot be obtained on short notice, but, during a long encampment, it can be made by the military units themselves.

2. Coal is plentiful in this area. The estimate of coal in the Cheremkovo coal mines in Irkutsk Oblast is 1,500,000,000 tons. About 4,500,000 tons is produced annually, and about 25 percent is exported to Central USSR.

| State | Coal Mine | Yearly Output (in 10,000 tons) | Amount Unmined (in 10,000 tons) | Location | Type of Coal |
|---|---|---|---|---|---|
| Chita Oblast | Chernovskoye Kopi | 150 | 15,000 | 18 km southwest of Chita | Lignite |
| | Tarbagatai | 10 | 11,000 | In neighborhood of Tarbagatai. Station in Khilok River Valley. | Lignite |
| Buryat Mongolian ASSR | Gusinoye Lake | 14 | 20,000 | 120 km south of Ulan Ude | Lignite |
| | Rysogorski | 2.5 | 1,000 | Near Ular Ude | Bituminous |
| | Jida | | 8,250 | Jida River Valley | Bituminous |
| Irkutsk Oblast | Cheremkhovo | 450 | 150,000 | Neighborhood of Cheremkhovo Station | Bituminous |
| | Borobinski | Small Amount | 120 | 1.5 km from Borobinksi Station | Bituminous |
| | Savitoiski | Small Amount | 10,000 | 25 km to northwest of Cheremkhovo Station | Lignite |
| | Golovinski | Small Amount | 10,000 | In neighborhood of Glovovinskaya Station | Bituminous |
| | Vladimirovski | Small Amount | 5,000 | 7 km northwest of Golovinskaya Station | Bituminous |
| | Delyurski | 0.7 | 150 | Tyret-Zhiminski District | Bituminous |
| | Barkharvoski | 5 | 185 | Right bank of Angara River | Lignite |
| Outer Mongolia | Nalaykhu | 20 | 50,000 | 38 km southeast of Ulan Bator | Lignite |

## II. RATIONS

A. Important Provisions (Food)

Of the grains produced in this area, rye is the most important, with wheat and oats next. Of lesser importance are millet, buc,wheat and barley. The total yield is not large, but, due to the sparseness of the population, there is a small surplus. The following are tables of the harvest and supply surplus conditions in these districts:

Harvest

| District | Area Sown (ha) | Yield per ha (tons) | Total Yield (tons) | % | Tons Used as Food | % | Used as fodder (tons) |
|---|---|---|---|---|---|---|---|
| Buryat ASSR | 470,000 | 0.55 | 259,000 | 71 [sic] | 184,000 | 35 [sic] | 75,000 |
| Irkutsk Oblast | 760,000 | 0.65 | 494,000 | 65 [sic] | 321,000 | 29 [sic] | 173,000 |
| Total | 1,230,000 | 0.61 | 753,000 | 67 | 505,000 | 33 | 248,000 |

Supply Surplus

| District | Produced (tons) | Consumed | | | | Surplus (tons) |
|---|---|---|---|---|---|---|
| | | Inhabitants | Troops | Used for seed | Total | |
| Buryat ASSR | 184,000 | 102,000 | 4,000 | 54,000 | 160,000 | 24,000 |
| Irkutsk Oblast | 321,000 | 226,000 | 2,000 | 82,000 | 310,000 | 11,000 |
| Total | 505,000 | 328,000 | 6,000 | 136,000 | 470,000 | 35,000 |

Flour mills are increasing and there are now many in the principal villages, as well as in the towns. The greater number of them operate as a cooperative organization and are mainly small-scale flour mills with a yearly output of 1,000 tons or less. In the larger cities, there are large-scale, government-operated flour mills. Besides supplying the needs of the city in which they are located, they also supply the surrounding towns.

B. Secondary Provisions (Food)

1. Potatoes and Vegetables:

After the outbreak of the Russo-German War, potatoes and vegetables became the main civilian food staples, and they tried to increase the production of these to meet the food problem. Some considerable results seem to have been achieved by strengthening and expanding secondary farms. The estimated production for the 1944 fiscal year is as follows.

| Name of district | Potatoes | Vegetables |
|---|---|---|
| Buryat-Mongolian ASSR | 97,000 Tons | 34,000 Tons |
| Irkutsk Oblast | 330,000 Tons | 47,000 Tons |
| Total | 427,000 Tons | 81,000 Tons |

On investigation, it was found that, after the outbreak of the Russo-German War, transportation of potatoes and vegetables was almost completely halted in order to carry as much war material as possible, and consequently, there were shortages in some areas. These areas found it necessary to become self-sufficient.

2. Meat:

The climate of this district is very suitable for animal raising, and the large number of Mongolian tribes who have lived here since ancient times have made it one of the leading livestock-raising areas. Among the domestic animals, cows and sheep are the most numerous. Lamb and mutton are the principal meat diets. The number of livestock in these provinces is indicated below:

| Place | Cattle | Sheep & Goats | Hogs | Total |
|---|---|---|---|---|
| Buryat-Mongolian ASSR | 358,000 | 483,000 | 43,000 | 884,000 |
| Irkutsk Oblast | 401,000 | 325,000 | 130,000 | 856,000 |
| Total | 759,000 | 808,000 | 173,000 | 1,740,000 |

Methods of animal raising are very primitive. There are few protective buildings for the animals, and their food is principally natural grass. Consequently, in years when grass fails to grow or when the snowfall is very heavy, many of the livestock die due to lack of forage. Under such conditions, livestock do not develop satisfactorily. The average amount of meat obtained from one slaughtered animal is as follows: beef, 95 kilograms; lamb, 15 kilograms; and pork, 18 kilograms.

3. Fish:

The Ulan Ude Baikal Fishing Trust operates fishing boats in the various rivers flowing into Lake Baikal and supervises and exercises general control over marine products. The annual catch is about 8,000 tons and usually cannot furnish more than half the supply for the area.

4. Condiments and Luxuries:

a. Salt:

The Usole Salt Factory, which is the biggest in Siberia, is located in this district. Its yearly output is about 70,000 tons. Commercial industries in this area use about 30,000 tons. About 20,000 tons are used for table salt. The remainder is shipped to the areas east of Chita Oblast especially to the coast and the area around Harbin.

b. Sugar

The annual sugar output in this area is not more than 1,000 tons. The greater part of the sugar demand is met by lend-lease sugar from America.

C. Fodder

1. Forage:

The grain harvest used for animal feed in this area is about 250,000 tons (see section on main food supplies). In wartime, due to the lack of food supplies for the people, the supplies of livestock feed suitable for human consumption are diverted to that use, resulting in a proportionate shortage in livestock feeds.

2. Hay:

Before the outbreak of the Russo-German War (1940), the amount of hay grown was as follows:

| Name | Area Planned to Plant (1,000 has) | Percent Planted | Actual Area Planted (1,000 has) | Avg Yield per ha | Harvested |
|---|---|---|---|---|---|
| Buryat ASSR | 615 | 75 | 461 | 1.3 Tons | 600,000 Tons |
| Irkutsk Oblast | 640 | 80 | 512 | 1.4 Tons | 717,000 Tons |
| Total | 1,255 | 77 | 973 | 1.35 Tons | 1,317,000 Tons |

With the lengthening of war, labor and machinery shortages have reduced the hay harvest about 30 percent (to about 900,000 tons). Although there is a shortage now, the raising of hay is gradually reaching a level of self-sufficiency.

There are mixed-feed factories in Irkutsk. Hay is their principal raw material and their yearly fodder output of about 20,000 tons is mainly set aside to supply the Far Eastern Army.

Part 7. WEATHER

## I. GENERAL SUMMARY

A. Special Weather Characteristics

Except for the immediate area around Lake Baikal, the weather is markedly continental in character. Its distinguishing characteristics compared with the climate of Northern Manchuria are that the rainfall is very light and the piled up snow in the northern part is greater. However, there is less snow in the southern part and almost none in Outer Mongolia. The heavy rainfall area extends from the northwestern slopes of the Hamardaban Mountain Range (located to the south of Lake Baikal) to the shores of the lake itself. In the opposite direction, the rainfall is lighter and, in Outer Mongolia, there is almost none at all.

B. General Weather Conditions

Spring lasts for 30 or 40 days, from the middle of April to the middle of May. Summer extends from the latter part of May to the latter part of August. Fall is from 30 to 40 days long and lasts from the beginning of September to the latter part of October. Winter extends from the middle of October to early April. The extreme winter weather is from the latter part of December to early March, and the height of summer is in the month of July. The rainy season west of Lake Baikal is from May to September and, to the east of Lake Baikal, from June to September. The greatest winds are during April. In the vicinity of Lake Baikal itself, they have high winds all year around.

NOTE: (i) Winter is arbitrarily determined as being that period between fall and spring, having an average temperature of zero degrees centigrade; summer is likewise determined by that period between spring and fall, having an average temperature of 10 degrees centigrade.

(ii) Extreme winter is that coldest period when the average temperature drops 20 degrees below zero centigrade. The "height of the summer" is that period of greatest heat when the temperature rises above 30 degrees centigrade.

There are 25 locations along the Siberian Railroad, Russian-American air route, and in the neighborhood of Lake Baikal which have weather data for 10 years or more. Other areas have weather data for approximately 5 years. A small weather-observing network covers the Vitim tableland, the Yablonovy Mountain chain, and districts in Outer Mongolia.

## II. IMPORTANT WEATHER CONDITIONS RELATING TO OPERATIONS

A. Temperature

1. In summer, the extremes of the hot summer period are reached in July, and the temperature goes up to around 35 degrees centigrade. The humidity remains low, and, consequently, the effect of heat on the body is comparatively low. The temperature along the Shilka River reaches 37-38 degrees centigrade, whereas the temperature around Lake Baikal does not rise above 30 degrees centigrade, and that only in late August when the heat comes from other areas.

2. In the extreme winter weather, the lowest temperature is about minus 50 degrees centigrade, and, even though it only goes to minus 40 degrees centigrade around Lake Baikal, one must be careful, because strong winds accentuate the cold.

3. Temperature Inversions:

In wintertime, there are temperature inversions in this area, and military gas will lie low very well. At dawn on clear days, however, the temperature changes are reduced, and, curiously enough, using a small amount of gas is ineffective.

Temperature inversions at dawn in the summertime provide opportunities for the use of gas.

4. Freezing of the Ground:

Though the ground is generally frozen from the middle of September until late May (in the north until the middle of June), when it thaws near the surface, there are places where the subsoil is permanently frozen to a depth of 50 feet. Consequently, care must be taken of water pipes, etc, buried in the earth.

5. Violent Changes in Temperature:

In the low plain around the Siberian Railroad's tracks in the western section of the Lake Baikal basin and in the Vitim River Valley, there is an average range in temperature of about 15 degrees centigrade in both summer and winter, but, in June, the daily temperature range has reached an extreme of 30 degrees centigrade, and there have been times when a temperature of 0 degrees centigrade has been recorded for 8 days in the summertime.

B. Rainfall

1. The rainfall in the area from Lake Baikal to the Khamardaban Mountain Range is comparable to Central Manchuria and the rainy season is from May to September.

2. The Selenga River delta area (on the east shore of Lake Baikal) and southern Jima around the lower reaches of the Angara River form the rainy district. In the rainy season, this presents an obstacle.

C. Snowfall

1. The first snowfall usually comes in the middle of September. In the upper reaches of the Lena River, the Irkutsk district, and the Russo-Manchurian border area, it occurs early in September. In the basin to the west of the Angara River, it occurs between late September and early October.

2. The amount of snowfall throughout the winter in the valley (or basin) to the east of Lake Baikal, which the Siberian Railroad follows, a minimum snowfall is from 10 to 20 centimeters for the season. In the Vitim tableland, the upper reaches of the Lena River Valley, and the high mountain belt north and northwest of Lake Baikal, the snowfall reaches from 40 to 60 centimeters. The period of snowfall of over 20 centimeters is from early December to early April in the north, but, in the northeast, it is longer and lasts from early November to late April. In the west, it is shorter, lasting from the middle of January to early March.

3. Snowfall generally ends by the middle of May, and, in the mountainous districts to the north, one may occasionally see snowfall as late as the end of May or early June. In the mountain regions of the Russo-Manchurian border, the snowfall resembles that of the northern areas.

D. Wind

Throughout all this area, the north and northwest winds are mild, and it is generally suitable for chemical warfare; but, in the neighborhood of Olkhon Island, near the west bank of Lake Baikal, they have hurricanes, and the northwest winds are strong throughout the year.

E. Day, Night and Twilight

Aside from twilight, the period of shortest night in the neighborhood of Ulan Bator is in June and July, when night lasts for only an hour. To the north, there is usually no night at all from May to August, but only about 5 to 8 hours of twilight. One must consider night operations unders such conditions.

## III. AEROLOGY

A. Upper Air Temperatures

1. The Chita area is comparable to Northern Manchuria (Hai-la-erh), but the Irkutsk area is slightly warmer in winter and cooler in summer.

2. In the wintertime, there is a temperature inversion of 500 meters (altitude), at 1 kilometer in Chita and at 1 kilometer in Irkutsk. In the strata below this level, visibility is poor because of mist and haze.

3. The stratosphere begins at 8 kilometers in winter, 11 kilometers in summer, and about 9 kilometers in the spring and fall.

4. The air temperature becomes 0 degrees centigrade at an altitude of 3.5 kilometers in the summer and 300 meters (above the ground) in fall and spring.

5. Freezing temperatures exist in clouds at low altitudes sometime between late fall and early winter, beginning during the first cold spells of winter and also occurring frequently in medium and high-altitude clouds in a mild summer.

B. High Altitude Winds

1. The period when high-altitude winds blow hardest is in February, March and April. At 3 kilometers (altitude), the speed is 14 meters per second, and, at 5 kilometers, the speed reaches about 20 meters per second. During other months, the wind velocity is generally low.

2. Except for low-altitude winds in the summer and high-altitude winds (around 3 kilometers) in the spring, the wind direction generally ranges from west to northwest.

C. Cloud Levels and Amount of Clouds

1. In summer, the clouds are generally distributed equally half above and half below the 1,500-meter level. Clouds are plentiful in the morning around Kerensk, Bodaibo, etc., but there are few in the afternoon and evening. The abundance of low-level clouds creates a barrier to air navigation along the southern shores of Lake Baikal (the Khamardaban Mountain Range) and in the Kerensk and Bodaibo areas.

2. Although it snows much of the time during the winter, since it does not snow for long from clouds above 1,500 meters, nor are such snows very heavy, these provide little hindrance to air navigation.

D. Thunder and Lightning

There is much thunder and lightning in the area between the inland rivers to the north of Kerensk, Northern Baikal, and the foot of the Khamardaban Mountain Range in the upper reaches of the Angara River to the south of the lake. The mountain district bordered by the Ilim River, the Angara River and the upper reaches of the Lena River is second to the above area in amount and violence of thunder and lightning.

E. Mist and Fog

In the wintertime, there is fog and mist in the Irkutsk and Bodaibo neighborhood, while, in the summer, it is found in: (1) the mountain district bounded by the Ilim River, the Angara River, and the upper branches of the Lena River; (2) the Selenga River delta area; (3) the middle section of the Shilka River Valley; and (4) the Sretensk region. In the other seasons, there is a little fog or mist, which occurs very early in the morning in summer and in the evenings and early mornings in winter. This is important throughout the year, and there are occasions when the various districts have 2 and 3 days of rain in the summer (rainy season) which will present serious hazards from a military and air-navigation standpoint.

Of the charts that follow, the first six indicate atmospheric phenomena by months in principal places.

1. Chita

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year Total (or Avg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg Temp - | -27.1 | -22.3 | -12.6 | 0.4 | 8.0 | 16.7 | 18.9 | 15.5 | 8.7 | -1.8 | -13.1 | -24.2 | -2.7 |
| Highest Temp | - 4.6 | - 0.6 | 10.6 | 25.6 | 27.2 | 34.8 | 35.0 | 32.6 | 25.8 | 21.6 | 8.1 | - 1.3 | 35.0 |
| Lowest Temp | -46.2 | -44.0 | -35.1 | -25.5 | -10.5 | - 2.3 | 1.6 | - 2.9 | - 8.9 | -28.8 | -37.4 | -45.6 | -46.2 |
| Rain-fall | 2.1 | 2.3 | 2.7 | 8.1 | 27.3 | 43.6 | 81.8 | 84.3 | 30.9 | 11.2 | 4.5 | 5.2 | 304.0 |
| Avg [redacted] rol Cloud Amt | 3.1 | 2.9 | 3.4 | 5.0 | 6.3 | 6.0 | 6.5 | 6.4 | 5.3 | 5.4 | 4.4 | 3.4 | 4.9 |
| Prevailing Wind Dir | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW |
| Avg Wind Vel (m/sec) | 1.0 | 1.4 | 1.8 | 3.0 | 2.8 | 2.1 | 1.7 | 1.6 | 1.7 | 2.0 | 1.7 | 1.1 | 1.8 |
| Clear Days | 13.4 | 14.2 | 10.6 | 6.3 | 3.5 | 2.9 | 2.4 | 2.1 | 5.7 | 5.4 | 8.0 | 12.4 | 86.9 |
| Cloudy Days | 1.6 | 1.5 | 2.8 | 5.0 | 10.0 | 7.8 | 10.8 | 10.2 | 7.1 | 6.7 | 3.9 | 2.4 | 69.8 |
| Rainy Days | 2.6 | 2.6 | 2.9 | 3.9 | 7.6 | 7.8 | 11.2 | 13.5 | 7.5 | 4.4 | 3.0 | 5.0 | 72.0 |
| Thunder and Lightning | | | 0.0 | 0.0 | 0.6 | 3.1 | 5.4 | 3.9 | 0.5 | 0.0 | 0.0 | | 13.5 |
| Snowy Days | 2.6 | 2.6 | 2.9 | 3.2 | 2.6 | 0.0 | 0.0 | 0.0 | 0.6 | 4.0 | 3.0 | 5.0 | 26.5 |
| Foggy Days | 4.7 | 0.6 | 0.2 | 0.0 | 0.5 | 0.5 | 1.5 | 4.0 | 3.5 | 0.2 | 0.0 | 2.2 | 17.9 |

Ulan Bator

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year Total (or avg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg Temp | -24.5 | -20.1 | - 9.4 | 2.4 | 9.3 | 15.9 | 19.1 | 15.5 | 8.9 | - 1.4 | -12.4 | -24.0 | - 1.7 |
| Highest Temp | - 9.2 | - 4.4 | 14.7 | 21.5 | 26.9 | 31.6 | 34.9 | 31.6 | 25.8 | 19.4 | 10.4 | 40.2 | 34.9 |
| Lowest Temp | -37.4 | -35.4 | -32.1 | -31.8 | -10.0 | - 1.0 | - 1.9 | - 1.7 | -12,5 | -19.1 | -29.5 | -40.2 | -40.2 |
| Rain-fall | 1.0 | 0.6 | 3.3 | 1.9 | 11.3 | 25.0 | 34.0 | 72.4 | 23.7 | 9.3 | 6.4 | 3.4 | 192.3 |
| Avg-Netecrol Cloud Am | 3.0 | 3.2 | 4.2 | 4.8 | 5.6 | 6.3 | 6.2 | 5.5 | 5.4 | 3.6 | 4.2 | 3.4 | 4.6 |
| Prevailing Wind Dir | E | E | E | NW | NW | NW | NW | E | NW | NW | E | E | E and NW |
| Avg Wind Vel. (m/sec) | 2.1 | 2.3 | 3.1 | 3.5 | 3.8 | 3.3 | 2.8 | 2.6 | 2.8 | 2.3 | 2.1 | 2.0 | 2.7 |
| Clear Days | | | | | | | | | | | | | |
| Cloudy Days | 2 | 2 | 4 | 3 | 5 | 9 | 9 | 7 | 7 | 3 | 3 | 3 | 57 |
| Rainy Days | 1 | 3 | 3 | 2 | 3 | 7 | 10 | 11 | 6 | 2 | 3 | 4 | 55 |
| Day Thunder and Lightning | | | | | | | | | | | | | |
| Snowy Days | | | | | | | | | | | | | |
| Foggy Days | | | | | | | | | | | | | |

3. Ulan Ude (Verkhne Udinsk)

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year Total (or avg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg Temp | -26.7 | -21.7 | -11.9 | 0.5 | 8.5 | 16.2 | 19.2 | 16.4 | 8.4 | 0.9 | -13.0 | -21.5 | 2.2 |
| Highest Temp | - 6.9 | - 0.2 | 10.4 | 26.4 | 28.7 | 34.4 | 37.1 | 35.5 | 29.0 | 18.4 | 6.4 | 0.0 | 37.1 |
| Lowest Temp | -47.4 | -44.7 | -36.8 | -23.2 | -12.6 | - 2.9 | 1.2 | - 3.1 | - 9.9 | -27.9 | -33.6 | -48.7 | -48.7 |
| Rain-fall | 3.4 | 2.0 | 1.8 | 5.5 | 11.7 | 25.7 | 47.6 | 48.6 | 24.8 | 7.0 | 8.7 | 7.7 | 194.5 |
| Avg-Meteorol Cloud Am | 4.6 | 4.3 | 5.0 | 5.9 | 6.6 | 7.1 | 6.7 | 5.9 | 5.5 | 6.2 | 6.1 | 5.4 | 5.8 |
| Prevailing Wind Dir | E (NW) | NW | NW | NW | NW | NW | NW | NW | NW | NW | E (NW) | NW | NW |
| Avg Wind Dir-Vel (m/sec) | 0.8 | 0.8 | 1.2 | 2.1 | 3.6 | 1.9 | 1.7 | 1.6 | 1.8 | 1.9 | 1.2 | 0.8 | 1.6 |
| Clear Days | 7.2 | 8.3 | 6.5 | 3.9 | 3.1 | 2.0 | 3.3 | 4.0 | 4.6 | 4.7 | 4.0 | 6.1 | 58.2 |
| Cloudy Days | 5.0 | 4.2 | 5.5 | 7.2 | 10.5 | 12.9 | 11.5 | 8.5 | 6.9 | 9.7 | 9.2 | 8.1 | 99.2 |
| Rain Days | 3.3 | 2.6 | 1.8 | 2.8 | 4.7 | 7.0 | 9.7 | 9.8 | 6.3 | 6.4 | 5.6 | 6.9 | 67.2 |
| Days of Thunder and Lightning | | | | | 0.5 | 2.5 | 7.0 | 2.5 | 0.5 | | | | 13.0 |
| Snowy Days | 3.5 | 2.6 | 1.8 | 2.1 | 1.4 | 0.0 | 0.0 | 0.0 | 0.8 | 4.3 | 5.4 | 6.7 | 28.7 |
| Foggy Days | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.3 | 1.6 | 2.3 | 0.3 | 0.0 | 0.0 | 5.9 |





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4. Irkutsk

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year Total (or avg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg Temp | -20.2 | -18.6 | -10.7 | 0.4 | 8.2 | 15.8 | 17.6 | 15.8 | 8.5 | 0.0 | - 9.0 | -18.5 | - 0.9 |
| Highest Temp | 0.4 | 1.4 | 11.9 | 27.9 | 30.4 | 33.0 | 34.4 | 32.5 | 27.4 | 20.8 | 10.8 | 1.7 | 34.4 |
| Lowest Temp | -44.2 | -42.6 | -36.8 | -25.1 | -13.6 | - 4.1 | 0.4 | - 2.7 | -10.0 | -30.5 | -36.0 | -44.4 | -44.4 |
| Rain fall | 9.8 | 8.0 | 8.6 | 16.2 | 31.3 | 51.1 | 73.2 | 82.2 | 41.4 | 20.5 | 18.3 | 18.2 | 378.8 |
| Avg Meteorol Cloud Am | 5.8 | 4.7 | 5.2 | 6.3 | 7.4 | 7.4 | 7.5 | 7.2 | 6.6 | 7.0 | 7.0 | 7.0 | 6.6 |
| Prevailing Wind Dir | SE | SE | NW | NW | NW | SE | SE | NW | NW | NW | NW | NW | NW |
| Avg Wind Vel (m) | 2.3 | 2.2 | 2.5 | 3.3 | 3.7 | 2.9 | 2.4 | 2.3 | 2.7 | 2.7 | 2.3 | 1.7 | 2.6 |
| Clear Days | 4.5 | 7.6 | 6.4 | 2.4 | 1.7 | 1.1 | 1.5 | 2.0 | 2.7 | 2.9 | 1.8 | 2.3 | 36.9 |
| Cloudy Days | 8.1 | 5.0 | 7.0 | 9.5 | 15.3 | 14.7 | 16.0 | 12.9 | 11.6 | 14.5 | 12.4 | 13.1 | 140.1 |
| Rainy Days | 10.9 | 8.0 | 6.5 | 7.8 | 10.8 | 10.7 | 13.7 | 14.1 | 12.6 | 11.6 | 11.7 | 13.9 | 132.6 |
| Days Thunder and Lightning | | | 0.0 | 0.0 | 0.0 | 1.8 | 4.2 | 2.3 | 0.7 | 0.1 | 0.0 | | 9.1 |
| Snowy Days | 9.4 | 7.8 | 6.5 | 6.0 | 4.0 | 0.0 | 1.9 | 0.0 | 2.1 | 8.4 | 10.2 | 11.6 | 66.1 |
| Foggy Days | 6.6 | 0.3 | 0.0 | 0.3 | 0.3 | 1.7 | 2.9 | 4.4 | 4.0 | 2.9 | 7.6 | 14.1 | 45.1 |





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5. Kirensk

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year Total (or avg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg Temp | -27.3 | -22.4 | -13.0 | - 2.2 | 6.9 | 15.1 | 18.7 | 15.0 | 7.0 | - 2.8 | -15.7 | -24.6 | - 3.8 |
| Highest Temp | 1.7 | 2.1 | 10.3 | 21.4 | 29.6 | 33.7 | 34.8 | 34.7 | 36.2 | 17.8 | 5.0 | 1.7 | 34.8 |
| Lowest Temp | -55.5 | -53.1 | -42.1 | -31.7 | -15.4 | - 4.2 | 0.4 | - 5.3 | - 9.0 | -30.3 | -45.2 | -52.1 | -55.5 |
| Rain fall | 21.5 | 12.5 | 13.5 | 11.8 | 23.6 | 45.1 | 40.7 | 57.3 | 448.5 | 29.6 | 25.9 | 25.1 | 354.7 |
| Avg-Meteorol Cloud Amt | 6.4 | 5.3 | 6.3 | 6.5 | 6.9 | 6.5 | 6.0 | 6.5 | 7.2 | 7.9 | 8.0 | 16.1 | 6.6 |
| Prevailing Wind Dr | SW | SW | NW | W | SW | SW | S | SW | SW | SW | SW | SW | SW |
| Avg Wind Vel M | 2.0 | 0.8 | 2.1 | 2.4 | 2.8 | 2.2 | 1.9 | 1.9 | 2.1 | 2.6 | 2.6 | 1.8 | 2.2 |
| Clear Days | 5.6 | 6.2 | 5.5 | 2.7 | 2.9 | 3.5 | 4.5 | 4.0 | 1.6 | 2.1 | 1.7 | 7.0 | 48.4 |
| Cloudy Days | 13.3 | 7.6 | 12.1 | 11.0 | 12.6 | 11.3 | 9.0 | 12.0 | 14.2 | 19.3 | 18.0 | 12.8 | 153.2 |
| Days Thunder and Lightning | | | 0.0 | 0.0 | 0.8 | 3.1 | 2.3 | 2.7 | 0.6 | 0.0 | 0.0 | | 9.5 |
| Snowy Days | 18.6 | 13.6 | 14.3 | 8.6 | 4.2 | 0.0 | 0.0 | 0.0 | 3.4 | 15.4 | 21.5 | 17.3 | 116.9 |
| Foggy Days | 0.3 | 0.6 | 0.0 | 0.0 | 0.6 | 0.9 | 2.7 | 6.0 | 5.4 | 0.9 | 0.1 | 1.6 | 19.1 |

6. Bratskoye

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year Total (or avg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg Temp | -22.1 | -19.6 | -11.2 | - 2.3 | 7.2 | 15.3 | 18.5 | 15.1 | 7.6 | - 2.5 | -11.1 | -23.9 | - 2.4 |
| Highest Temp | 3.5 | 0.2 | 9.3 | 15.1 | 27.5 | 33.3 | 31.3 | 30.8 | 24.9 | 18.7 | 6.2 | 1.3 | 33.3 |
| Lowest Temp | -48.4 | -46.7 | -37.6 | -27.2 | -11.9 | - 2.2 | 1.6 | - 1.3 | - 7.9 | -32.5 | -46.6 | -48.6 | -48.6 |
| Rain-fall | 10.0 | 4.3 | 6.3 | 14.3 | 31.5 | 44.0 | 55.4 | 71.2 | 31.2 | 23.8 | 13.2 | 12.5 | 319.7 |
| Avg Meteorol Cloud Amt | 7.0 | 6.2 | 6.8 | 6.4 | 7.2 | 7.7 | 7.4 | 7.2 | 7.3 | 8.2 | 7.9 | 6.9 | 7.2 |
| Prevailing Wind Dir | W | W | W | W | W | W | W | W | W | W | W | W | W |
| Avg Wind Vel (m/sec) | 2.2 | 2.1 | 3.5 | 3.3 | 3.8 | 3.4 | 2.4 | 2.5 | 2.7 | 3.2 | 2.9 | 2.1 | 2.8 |
| Clear Days | 3.8 | 5.5 | 2.3 | 3.0 | 3.3 | 0.0 | 2.5 | 0.8 | 2.2 | 1.4 | 1.4 | 3.4 | 29.6 |
| Cloudy Days | 13.0 | 11.8 | 15.5 | 9.5 | 11.5 | 14.3 | 13.3 | 12.5 | 13.6 | 21.0 | 17.2 | 13.2 | 166.4 |
| Rainy Days | 11.0 | 5.5 | 7.0 | 9.0 | 11.0 | 11.4 | 12.4 | 13.2 | 13.2 | 13.8 | 13.0 | 11.0 | 131.5 |
| Days of Thunder and Lightning | | | 0.2 | 0.0 | 0.8 | 3.0 | 5.0 | 3.4 | 0.0 | 0.0 | 0.0 | | 12.4 |
| Snowy Days | 11.0 | 5.5 | 6.9 | 8.3 | 6.2 | 0.4 | 0.0 | 0.0 | 1.8 | 10.8 | 12.5 | 11.0 | 74.4 |
| Foggy Days | 0.0 | 0.9 | 0.0 | 0.3 | 0.5 | 0.8 | 4.0 | 6.0 | 6.0 | 1.8 | 0.2 | 0.8 | 20.4 |

Number of Days Unsuited for Flying

| Place \ Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kirensk | 3 | 3 | 3 | 6 | 10 | 6 | 9 | 9 | 10 | 12 | 5 | 3 |
| Gruznovka | 6 | 3 | 7 | 6 | 9 | 10 | 10 | 10 | 11 | 13 | 11 | 6 |
| Irkutsk | 3 | 2 | 2 | 4 | 7 | 9 | 9 | 8 | 9 | 6 | 6 | 6 |
| Recapitulated high* | 6 | 3 | 7 | 6 | 10 | 10 | 10 | 10 | 11 | 13 | 11 | 6 |
| Chita | 2 | 1 | 2 | 4 | 5 | 8 | 9 | 9 | 6 | 5 | 4 | 2 |
| Khilok | 3 | 3 | 4 | 8 | 9 | 8 | 9 | 9 | 9 | 9 | 7 | 4 |
| Ulan Ude | 2 | 2 | 2 | 3 | 5 | 6 | 7 | 9 | 9 | 6 | 7 | 5 |
| Irkutsk | 3 | 2 | 2 | 4 | 7 | 9 | 9 | 8 | 9 | 6 | 6 | 6 |
| Recapitulated high* | 3 | 3 | 4 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 6 |
| Nizhne Udinsk | 4 | 4 | 3 | 6 | 7 | 6 | 8 | 11 | 11 | 9 | 9 | 5 |
| Zima | 1 | 1 | 4 | 5 | 7 | 4 | 9 | 8 | 8 | 6 | 5 | 3 |
| Irkutsk | 3 | 2 | 2 | 4 | 7 | 9 | 9 | 8 | 9 | 6 | 6 | 6 |
| Recapitulated high* | 4 | 4 | 4 | 6 | 7 | 9 | 9 | 11 | 11 | 9 | 9 | 6 |
| Chita | 2 | 1 | 2 | 4 | 5 | 8 | 9 | 9 | 6 | 5 | 4 | 2 |
| Bogdarin | 2 | 1 | 1 | 9 | 10 | 6 | 8 | 9 | 8 | 8 | 7 | 2 |
| Bodaibo | 3 | 2 | 1 | 3 | 6 | 7 | 7 | 6 | 9 | 8 | 3 | 4 |
| Recapitulated high* | 3 | 2 | 2 | 9 | 10 | 8 | 9 | 9 | 9 | 8 | 7 | 4 |
| Chita | 2 | 1 | 2 | 4 | 5 | 8 | 9 | 9 | 6 | 5 | 4 | 2 |
| Aginskoye | 0 | 0 | 1 | 2 | 3 | 2 | 7 | 3 | 3 | 3 | 4 | 2 |
| Borzya | 0 | 0 | 1 | 2 | 6 | 6 | 6 | 7 | 5 | 2 | 2 | 0 |
| Man-chou-li | 1 | 1 | 1 | 1 | 3 | 7 | 9 | 8 | 6 | 2 | 1 | 1 |
| Recapitulated high* | 2 | 1 | 2 | 4 | 5 | 8 | 9 | 9 | 6 | 5 | 4 | 2 |
| Chita | 2 | 1 | 2 | 4 | 5 | 8 | 9 | 9 | 6 | 5 | 4 | 2 |
| Ulan Ude | 2 | 2 | 2 | 3 | 5 | 6 | 7 | 9 | 9 | 6 | 7 | 5 |
| Kiakhta | 0 | 0 | 2 | 3 | 4 | 6 | 7 | 7 | 5 | 4 | 4 | 9 |
| Ulan Bator | 0 | 0 | 2 | 3 | 4 | 4 | 8 | 4 | 6 | 3 | 4 | 9 |
| Recapitulated high* | 2 | 2 | 2 | 4 | 5 | 8 | 9 | 9 | 9 | 6 | 7 | 9 |

NOTE: (i) The days given for Man-chou-li and Ulan Bator are those when there was 1 millimeter or more of rain.
(ii) The number of days given for the other places are those when there is a low ceiling and a cloud cover of 9 or higher (average of four observations per day).

*(TN: The maximum number of unsuitable days in the foregoing group).

Part 8. HEALTH

## I. GENERAL SUMMARY

In this region, general health conditions are poor because of the high altitude and the characteristic continental climate. Away from the railroads, health conditions grow increasingly worse, and the country is full of people suffering from various diseases; in this respect Outer Mongolia is even worse than Russia. To meet this situation, it is necessary to make thorough preparations.

The hygienic practices of the people differ with each tribe, but they are generally of a low standard. Recently, great improvements have been made in the Soviet Government's facilities, but the insufficiency of doctors and veterinaries and the lack of medicines and materials, etc., will obviously hamper military operations.

The most appropriate time for military operations from the standpoint of health is from May to September. In winter operations, one must perfect equipment for protection from the cold and, in summer operations, one must provide for defensive measures against flies, mosquitoes, etc. Measures must also be taken to secure an adequate water and food supply.

## II. PERSONNEL

### A. Acute Communicable and Prevalent Diseases

Information on diseases of this region is very scanty, especially of the area to the west of Lake Baikal. Although details about the outbreak of epidemics are not known, it appears that among the communicable diseases, typhus diseases, dysentery, and others are of primary importance, while eruptive typhus, recurrent fever, bubonic plague and others come second. Eruptive typhus, especially, is often contracted while riding in trains. Among the prevalent diseases, especially in Outer Mongolia, the best known ones are genital tuberculosis, trachoma, etc. Others such as scurvy, anthrax, and leprosy often break out in epidemics. Argun Fever (from the Argun River) differs from these and affects the district to the west of the Transbaikal Railway. Then it is understood that the lower classes also suffer frequently from parasitic dermatitis.

### B. Medical Installations

Medical institutions and installations existed in the big cities along the railroads, but they would hardly merit being called hospitals. Since the German war, ten army hospitals have been established in Jida and Irkutsk, and this region has become a convalescent center for wounded soldiers.

### C. Medical Supplies

There are practically no productive organizations or facilities for medical supplies in this region and obtaining medicines is especially difficult, but, since this is a heavily forested region, material for splints and stretchers is readily available.

## III. ANIMALS

A. Communicable and Prevalent Diseases

The situation regarding the rearing of domestic animals is very poor from the point of view of sanitation and health. Although it is not difficult to infer that they ordinarily have anthrax, glanders, pernicious anaemia, influenza, intermittent ophthalmia and other diseases, lack of information makes this fact uncertain. In June 1944, however, there was an epidemic of encephalitis among the horses in the Irkutsk Region; and in the Hou-pei-chia-erh district on the Soviet-Mongolian border, cattle plague is quite prevalent.

B. Insects Injurious to Men and Animals

In the tundra regions, damp places, marshes, etc, there are many horse, cow, and sheep flies in the summer which do a great deal of damage to both men and animals. They are often carriers of communicable diseases. On the steppes, there are many scorpions and poisonous spiders which can fell horses and camels with their sting. The poisonous spiders are grey and can by identified by a distinguishing spot of red on their abdomens.

C. Veterinary Facilities and Supplies

There are some animal-husbandry clinics and epidemic-control organizations along the railroad lines, but they have all been on a small scale, insufficient for actual needs. Veterinary supplies are unobtainable.

## IV. Conspectus of Hygienic Details Deserving Attention

A. Summer Operations (June to September)

1. Individual Equipment:

Portable mask for protection against mosquitoes is needed.

2. Unit Equipment:

Portable disinfectant containers are ideal for the extermination of lice and rats by chlorination when in barracks.

3. Food Supplies:

Besides being careful about the quick spoilage of meat provisions, it is imperative that horses eat green grass.

4. Water Supply:

The water supply in this region is all right for agriculture, animals, and drinking, but filter equipment should be used.

5. Special Points to Watch During Rainy Season:

One must be careful to keep clothes dry and take preventive measures against skin diseases.

B. Winter Operations (October to May)

1. Individual Equipment:

Soldiers need portable containers of frostbite ointment, breast warmers, portable fuel, etc., and complete anti-cold preparations must be made. It is best to carry warm blankets for the horses.

2. Unit Equipment:

Wood-cutting, ice-cutting, and water filtering equipment is needed, and ice runners (sleds, etc ) should be taken along. Measures should also be taken to keep liquid medicines from freezing, and anti-freeze liquids are an absolute necessity.

3. Food Supply:

It is necessary to insure against possible vitamin and fat deficiencies.

4. Water Supply:

It is necessary to provide methods for melting ice and snow and to train the horses to eat snow. A large supply of water should be prepared daily as a precautionary measure.

5. Direct Influences of Winter Weather:

Whenever possible, barracks should be erected. It must be remembered that, when troops are engaged in outside operations over an extended period of time, their fighting strength decreases considerably.

## Part 9 INDUSTRIES

### I. AGRICULTURE AND STOCKBREEDING

A. General

Topographically speaking, this locality has little arable land suitable for farming, and, moreover, the development of agriculture has been severely retarded by the effect of the weather. However, this region leads the Soviet Union in the production of livestock, the traditional occupation of the Mongolians.

Agriculture has developed considerably in the fertile, black-soil regions of the Selenga and Angara River basins.

Among domestic animals, cattle and sheep are raised in the greatest numbers. Husbandry methods are primitive, for there are scarcely any barn facilities, and feed consists for the most part of dried grass; in recent years, however, with the cultivation of pasturage and the building of barns, there has been a steady change toward intensive stock farming.

B. Grains

In this locality, rye is the most plentiful; wheat and oats come next; and then millet, buckwheat, barley, etc.

The cultivated area amounts to about 1,230,000 hectares (1944 estimate), and although this shows a total increase of 160,000 hectares over production before the Russo-German War, because of many bad conditions during the war, there was a decrease in the harvest of about 0.6 tons per hectare (usual harvest is 0.8 tons per hectare).

Thus, the total harvest was approximately 750,000 tons, and, not only was this generally sufficient for the demands of this locality, but it was enough to supply part of the area east of Chita.

The grain harvest is as follows (1944 estimate):

| Area | Buryat-Mongolian ASSR | | Irkutsk | |
|---|---|---|---|---|
| Cultivated Area | 470,000 hectares | | 760,000 hectares | |
| Harvest | 259,000 tons | | 494,000 tons | |
| Items | Food | Fodder | Food | Fodder |
| Percentage | 71% | 29% | 65% | 35% |

| Area | Buryat-Mongolian ASSR | | Irkutsk | |
|---|---|---|---|---|
| Cultivated Area | 234,000 hectares | 136,000 hectares | 494,000 hectares | 266,000 hectares |
| Yield per Hectare | 0.55 ton | 0.55 ton | 0.65 ton | 0.65 ton |
| Harvest | 184,00 tons | 75,000 tons | 321,000 tons | 173,000 tons |
| Excess (+) or Deficiency (-) | +24,000 tons | -15,000 tons | +11,000 tons | +23,000 tons |

C. Potatoes

In this locality, previous to the Russo-German War, there were about 50,000 hectares devoted to the cultivation of potatoes, but, since the outbreak of the war, efforts to increase the production of potatoes as a principal food substitute by expanding the number of subsidiary farms have resulted in an estimated 72,000 hectares under cultivation for 1944.

Though the cultivated area has been increased, shortage of labor will decrease the amount of harvest. The expected harvest is about 430,000 tons

Potato production for each area follows (1944 estimate):

| Region | Buryat-Mongolian ASSR | Irkutsk |
|---|---|---|
| Area Cultivated | 17,000 hectares | 55,000 hectares |
| Yield per Hectare | 5.7 tons | 6.0 tons |
| Total Harvest | 97,000 tons | 330,000 tons |

Since the outbreak of the Russo-German War, because the railroads have been absorbed in essential transportation, the transportation of potatoes has practically ceased, and each region has had to be self-sufficient.

D. Domestic Animals

In this region, there are cattle, horses, sheep, goats, swine, some reindeer, etc.

Domestic animals total about 2,000,000 head; cattle and sheep account for about 80 percent of this.

The number of domestic animals in each region is roughly as follows (1944 estimate):

| Kind of Animal | | Buryat-Mongolian ASSR | Irkutsk | Total |
|---|---|---|---|---|
| Horses | Work | 65,000 | 96,000 | 161,000 |
| | Non-work | 28,000 | 24,000 | 52,000 |
| | Total | 93,000 | 120,000 | 213,000 |
| Cattle | | 358,000 | 401,000 | 759,000 |
| Swine | | 43,000 | 130,000 | 173,000 |
| Sheep and Goats | | 483,000 | 325,000 | 808,000 |
| Reindeer | | 2,000 | 2,000 | 4,000 |
| Total | | 979,000 | 978,000 | 1,957,000 |

## II. FISHING

Fishing in this locality is centered about Lake Baikal and the various streams and rivers which flow into it. It is supervised and managed by the General Office at Ulan Ude and by the Baikal Fishing Trust in each district. The catches are small, not exceeding 8,000 tons. The majority of what is lacking is made up by imports from the coastal regions. This amount is estimated to be about 10,000 tons.

## III. MINING

A. Coal

With the exception of the Cheremkhovo coal mine, most of the coal mines in this locality were opened under the Second Five Year Plan. Since the beginning of the Russo-German War, an attempt has been made to increase production, but, due to the shortage of labor and various other wartime conditions, there has tended to be a general drop in production.

The Cheremkhovo Coal Mine (yearly production about 5,000,000 tons) is the largest mine in the eastern Soviet Union; its production now accounts for about 50 percent of the coal produced annually in the eastern Soviet Union (approximately 7,000,000 tons), and this supplies all the coal demands of the region. Present conditions are such that about 800,000 tons of the excess Cheremkhovo coal are sent to western areas.

The Irkutsk area is managed by the Eastern Siberia Coal Trust, and the Chita area, by the Eastern Coal Trust. A part of the coal fields in Irkutsk and Chernovskiye is under the supervision of the district Surplus Industries Commissariat.

B. Iron

The iron-ore fields are in the Ankaro Ilimsk district of Irkutsk Oblast and Balyaginski of Chita Oblast. At present, only the latter is in operation and it supplies the iron foundries of Petrovsk and Zabaikalskoye.

These foundries were the spear-manufacturing centers of 1789. In 1937, one portion was expanded and began production of steel ingots only. At present, they produce about 10,000 tons of pig iron and 57,000 tons of steel.

The other Irkutsk and Kuybyshevka metal factories and the Ulan Ude Railroad coach factory also produce steel. The total yearly production is about 80,000 tons (about 60,000 tons in steel products). The demand for finished steel products in this region is about 180,000 tons, and production can satisfy only a third of that. The remaining 120,000 tons are imported principally from central USSR.

C. Gold

Gold-ore resources are abundant and are found principally around the Lena River, the upper reaches of the Vitim River, and particularly in the vicinity of Bodaibo. They are managed by the following five trusts:

The Bodaibo Gold Mining Trust (Lena River and Bodaibo area)
The Nizhne Angarsk Gold Mining Trust (Nizhne Angarsk and Verkhne Angarsk areas)
The Barguzin Gold Mining Trust (Barguzin and Tsipikan areas)

The Transbaikal Gold Mining Trust (Chita Oblast)
The Baikal Gold Mining Trust (the same as, or associated with Nizhne Angarsk Gold Mining Trust.)

Gold mining has been gradually expanding since the beginning of the Russo-German War, so it is impossible to estimate present production.

D. Tin, Molybdenum, and Tungsten

1. Tin Ore:

The Transbaikal region contains the greatest deposits of (tin) ore in the Soviet Union, and the Khapcheranga and Sherlovagara mines are the largest producers. With the Jida deposits, these mines have shown the most conspicuous development recently.

2. Molybdenum Ore:

Ore deposits are in the Chikoi River basin and are the only ones in Transbaikal that have any industrial value. Recently, by utilizing the Jida Dam, the amount of mined ore delivered has been increasing continuously, as has the development of the Jida fields.

3. Tungsten Ore:

The Jida deposits contain superior tungsten ore, and the amount still unmined, together with the amount produced, comprises about 60 percent of the (reserves of the) Soviet Union. Recently, due to increased shipment of ore from Goryachinsk on the bank of Lake Baikal, the industrial value of this region has increased.

E. Mica

Most of the deposits in the entire eastern Soviet Union are in Irkutsk Oblast, and the only places producing there are Sludyanka, Mama, and Biryusa. Their production is approximately 10,000 tons, about 80 percent of the Soviet Union total.

Also, mines along the Lena River valley are now being opened.

Crushed stone from Mama, with that from Yakutsk ASSR, is collected at Vitim and sent by air to Irkutsk. It is then made into manufactured goods by the three factory trusts of Irkutsk, Slyudyanka and Zaozernaya.

F. Rock Salt

The largest salt works in the eastern Soviet Union is in Irkutsk Oblast at Usole. Total salt deposits are about 140,000,000 tons, and yearly production is approximately 70,000 tons. Industrial salt needs is this area are about 30,000 tons. Human and livestock consumption is about 20,000 tons. The total demand of over 50,000 tons is filled, and the remainder is shipped to the regions east of Chita.

## IV. MILITARY INDUSTRIES

A. General Remarks

There were few military industries in this region before the beginning of the Russo-German War, but, since then, there has been much activity toward expanding and strengthening them. The tendency has been to emphasize the manufacture of aircraft and ammunition and also to expand the manufacture of tanks and firearms. These industries have been established principally by moving factories from other regions and by converting portions of other-type factories. There has been very little new construction.

The principal military factories are located in such important regions as Chita, Petrovsk, Ulan Ude, Irkutsk, etc. They are well equipped and serve as rear-supply and replacement bases.

B. Aircraft Industry

At the end of 1941, Aircraft Factory No 39 was moved from Moscow to Irkutsk, and two ordinary factories were placed under its control to complete the project. Thus it was made the largest factory in the eastern Soviet Union. The majority of planes produced there have been sent west to the Russo-German lines.

C. Tank Industry

Recently some expansion has been effected by the moving of factory equipment from the Harbin area to Ulan Ude. Here they carry on tank assembly and do repair work on captured tanks.

D. Ammunition Industries

Some factories have been converted to the manufacture of ammunition, and this expansion now seems to have been completed. Most of the products are being sent to the westerr front. The converted factories were mainly railroad and machine shops.

Part 10. ADMINISTRATIVE DIVISIONS AND RACES OF PEOPLE

## I. ADMINISTRATIVE DIVISIONS

A. General Remarks

Soviet Russia is composed of the Russian Republic and 11 federated republics. The federated republics are divided into krais, oblasts, and autonomous republics, according to the size of the area. Krais, oblasts, and autonomous republics are further divided into districts, and districts into villages. The classification of cities differs according to size and political importance. The areas with which this document is concerned are the oblast of Irkutsk, the Buryat-Mongol Autonomous Republic, and the northern part of Outer Mongolia. The oblast of Irkutsk is composed of 27 districts, and the district of the Buryat Tribal Administration, which is divided into six districts, has 10 cities. The four cities under direct control of the state are Irkutsk, Usole, Cheremkhovo and Tulun. The Buryat-Mongol Republic is composed of 20 districts. The city of Ulan Ude is under direct control of the Republic.

B. Administrative Organizations

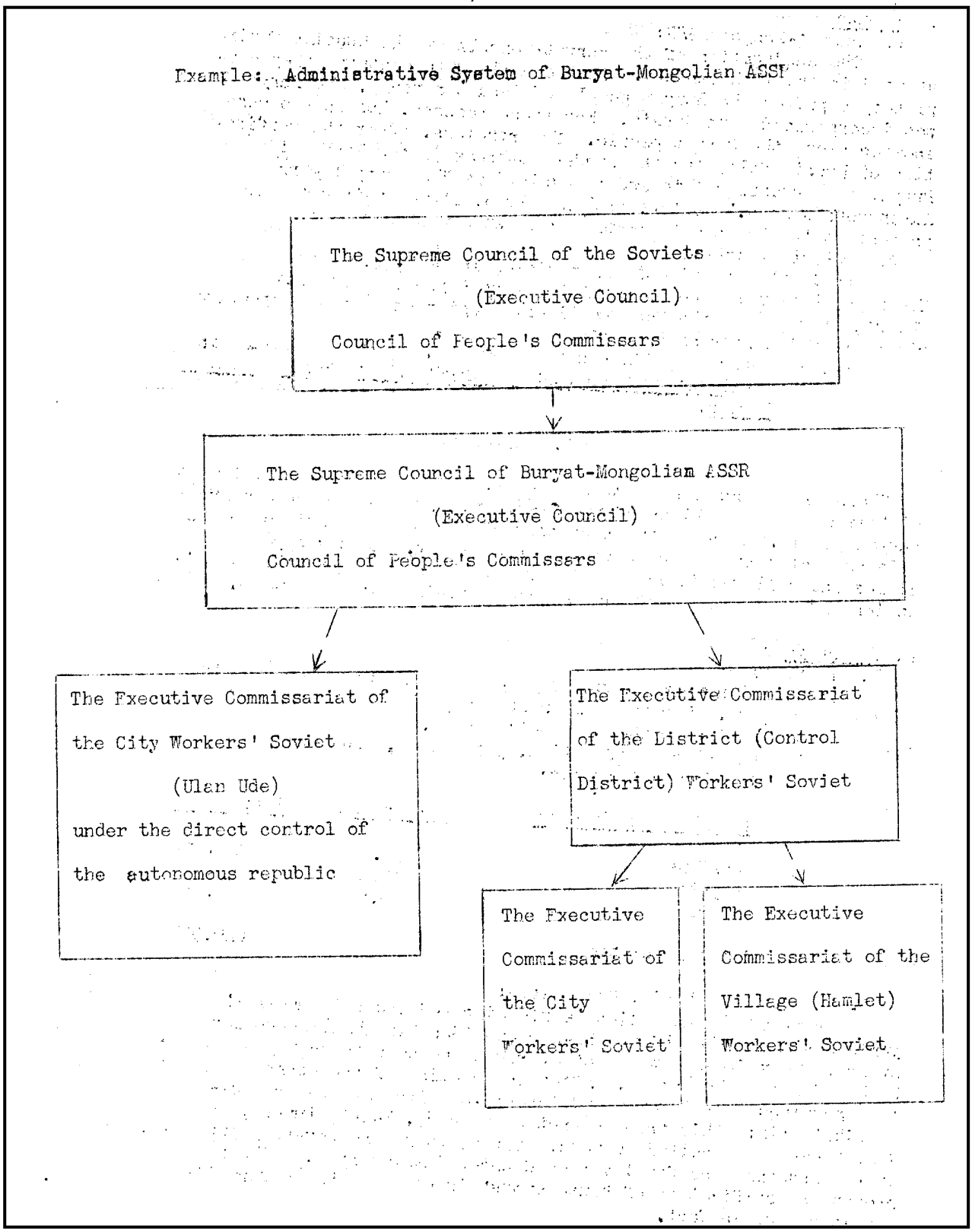
1. An oblast and an autonomous republic have the same standing as a krai, (Khabarovsk Krai, seacoast regions, etc), according to the Soviet system of administration. The highest sovereign organ is the oblast (or autonomous republic) workers' soviet (ie, soviet representing the workers). It receives orders from and is governed by the Executive Council of the Supreme Congress of the Russian Republic and the Congress of People's Commissars. The oblast (or autonomous republic) workers' soviet commands and supervises the district executive commissariats (Kushikkoiankai) which are under its jurisdiction. The oblast (or autonomous republic) workers' soviet is under the administration of the oblast (or autonomous republic).

2. A district is an administrative unit under the administration of the oblast (or autonomous republic). Its highest organ is the district soviet. It is directed and supervised by the oblast (or autonomous republic) soviet and its executive commissariat. The district soviet is under district administration. As an organ having direct control over villages and cities (with the exception of the cities controlled directly by the states and autonomous republic), it controls and supervises city and village affairs.

3. The highest city administrative organ is the city soviet. When the population under itsadministration exceeds 100,000, a district and district soviet are organized.

4. The village soviet is the lowest administrative organ in the Soviet Union.

Example: Administrative System of Buryat-Mongolian ASSR



C. History

1. Buryat-Mongol ASSR:

The subjugation of the Buryat-Mongols by the Russian Empire started in the 17th century. In the early 20th century, they completely deprived the Buryat people of land ownership, and Buryat was incorporated into Russia. For these reasons, Russia had many enemies among the Buryat people. Nevertheless, after the unification of Russia following the sudden outbreak of the Revolution, Buryat was organized into and recognized as "The Buryat Mongol Autonomous Region." Later, on 1 Aug 1923, it was raised to its present status as an autonomous socialist soviet republic.

2. Oblast of Irkutsk:

Until the organizational revision in 1937, along with the Krasnoyarsk region, the Buryat Autonomous Republic, and Chita Oblast, it composed the Eastern Siberia region as an administrative district of the Russian Republic.

NOTE: Outer Mongolia has been omitted, as it is included in the Military Topographical Study of the Eastern Baikal Region.

## II. RACES

Classified according to racial stock, the majority of inhabitants of this area are Russians of the Slavic race, while the others are Buryat people. Much of the territory of this area is suited to the life and activity of the people. Consequently, the development of cities and villages is limited to the southern part, and the distribution and condition of the races have certain characteristics.

A. The Buryats

1. Population:

The total number of Buryat people who inhabit this area is an estimated 300,000. For the most part, they live within the Buryat Republic, especially in the Lake Baikal area.

NOTE: Racial classification, population, and percentage of the Buryat Republic:

| Racial Classification | Percentage | Population |
|---|---|---|
| Russians | 52.7 | 331,952 |
| Buryats | 43.8 | 275,909 |
| Others | 3.5 | 22,046 |
| Total Population | | 629,907 |

2. History and Racial Composition:

Part of the Mongolian people migrated and fell under the jurisdiction of the Ch'eng-chi-ssu-han (Genghiz Khan) Mongolian Empire. They drove out the other races and came to occupy a zone on both sides of Lake Baikal. After the decline of the Mongolian Empire, they remained in this area and intermixed with various tribes--Merrikito (TN: this tribe cannot be traced), Yakut, Tungus, and Khalkha-and were called Buryats. Later, they were severely oppressed by the Russians and finally placed under Russian rule. Their present classification of "autonomous" is no more than a formality and is not so in fact.

3. Language and Religion:

The Buryat language and Russian are both used. As a result of a recent spread of education, most people understand Russian.

As for religion, in the northwestern sector where the activities and customs of many of the people resemble the Russian, more than half are Christians, while the others practice shamanism. Almost all are farmers. The southeastern sector, however, is influenced by the Khalkha tribe, and most of the natives practice lamaism. Here, the main occupation is animal husbandry.

4. Manners, Customs and Life:

Although not the practice everywhere, they generally adhere to the old customs of the Mongolian era. The intelligence level is generally low. However, the level of culture has risen enormously in recent years because of the Russian influence. The number of people engaged in politics, society, and cultural pursuits has shown a tendency to increase. With regard to food, they now eat more refined foodstuff. The dwelling for one household is usually composed of one to two tents, a covered barn and, sometimes, a winter repository for provisions and fodder. Buryat houses are round, broad, and small. In the southeastern sector is the so-called packet or envelope (tsutsumi). The people marry early, and the woman conducts the household affairs. Although they rarely bathe, they dislike intensely any work which makes their bodies dirty.

5. Ideology:

Along with the diffusion of the culture of the Latin alphabet and education, this area has been ideologically assimilated by Russia.

B. The Yakuts

1. Population:

There are 300,000 to 310,000 in all Russia. For the most part, they are found in the area extending from the Vitim River region to the vicinity of the city of Yakutsk. Approximately 200,000 of them live in the agricultural and animal-raising area in the basins of the Lena and Aldan Rivers.

2. Racial Composition and History:

They are a tribe belonging to the Turko-Tatar branch of the Ural-Altaic linguistic group. They and the Buryats are the most vigorous of all the peoples living under the jurisdiction of Soviet Russia. They are now forcing the Tungus to move, even though they live in the Yakut ASSR.

3. Language and Religion:

Their language is Yakut. It resembels very closely the languages of other races of the Turko-Tatar lineage. Many of them are Christians. Nevertheless, the shamanism of olden times still persists and as strong as ever.

4. Manners and Customs:

Their mode of dress has been Russianized. Only their peaked hats, leather coats, and wind-and-snow glasses made from horsehair remain from olden times. They eat horsemeat, beef, and stored-up green vegetables and drink kremiss and the milk of cows and horses. They live in small, round, thick houses.

The Yakuts first formed a "family society." Later, however, half of them were destroyed, and the other half entered a feudal system of society. Later they became Russianized, but, as stated above, many of their former customs have been handed down. For example, they consider the male superior and the woman inferior. Also, the sovereign person of the household is the father, and, when he becomes decrepit, the next eldest person becomes supreme. And the customs of marriage by purchase and early marriage are widely practiced. The level of culture has risen tremendously in recent years due to the leadership and influence of Russian government authorities.

C. The Tungus

These people live in a dense forest, leading a primitive, nomadic existence, and are great hunters. So thorough is their knowledge of geography, they never lose their way, no matter how dense a forest they are in. An honest people, they are very witty and cheerful, usually welcoming strange visitors. Living in small, round, conical-shaped houses, they usually wear clothes of reindeer and other animal skins. In winter, they wear anti-glare glasses [sic] made from horsehide. Their hunting implements are the rifle and axe, and, always accompanied by hunting dogs, they carry food along with them. Shamanists, they also practice polygamy, but this latter practice is gradually dying out.

D. The Tatars

The Tatars of this region were originally of a shamanistic religion, but, due to the influence of the Russians, many are now Greek Orthodox and, generally, understand the Russian language. Living in tents, most of them lead a nomadic existence.

E. The Russians

The Russians inhabit the southern region in the vicinity of the railroad, an area rich in natural resources.

SUPPLEMENTS

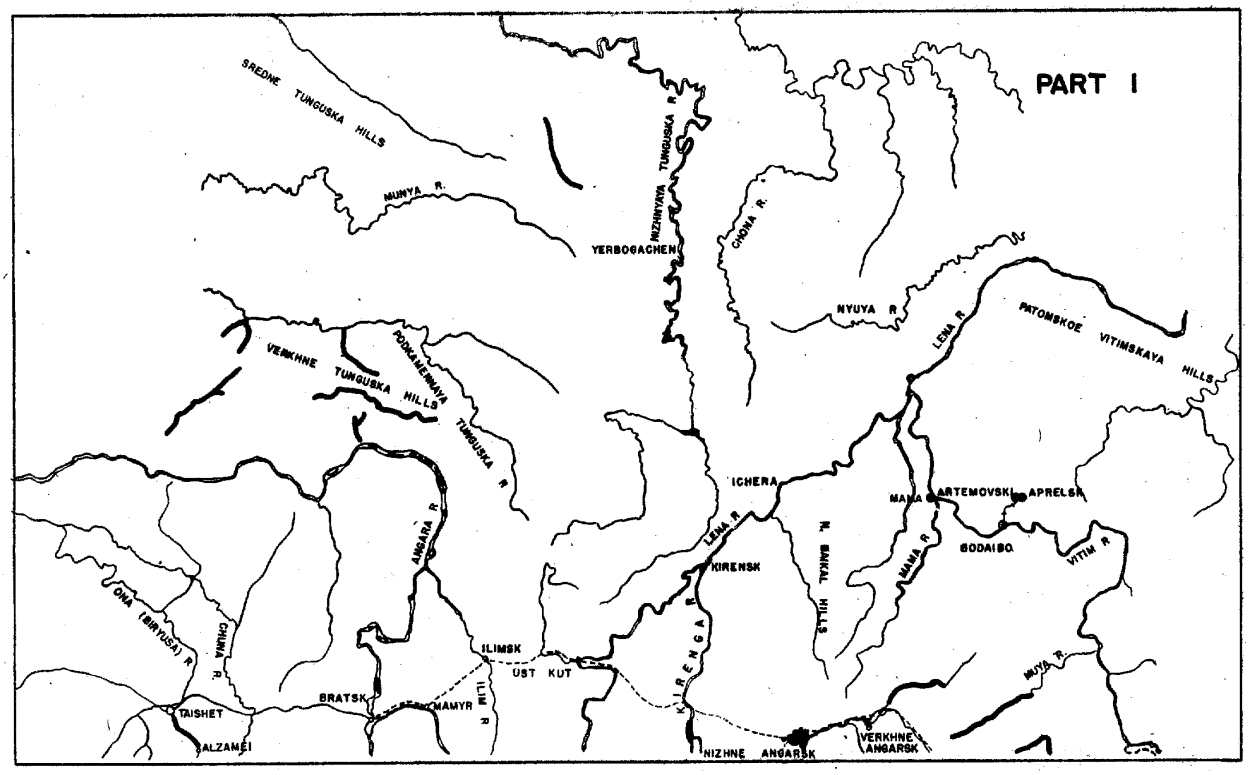
I. MAPS

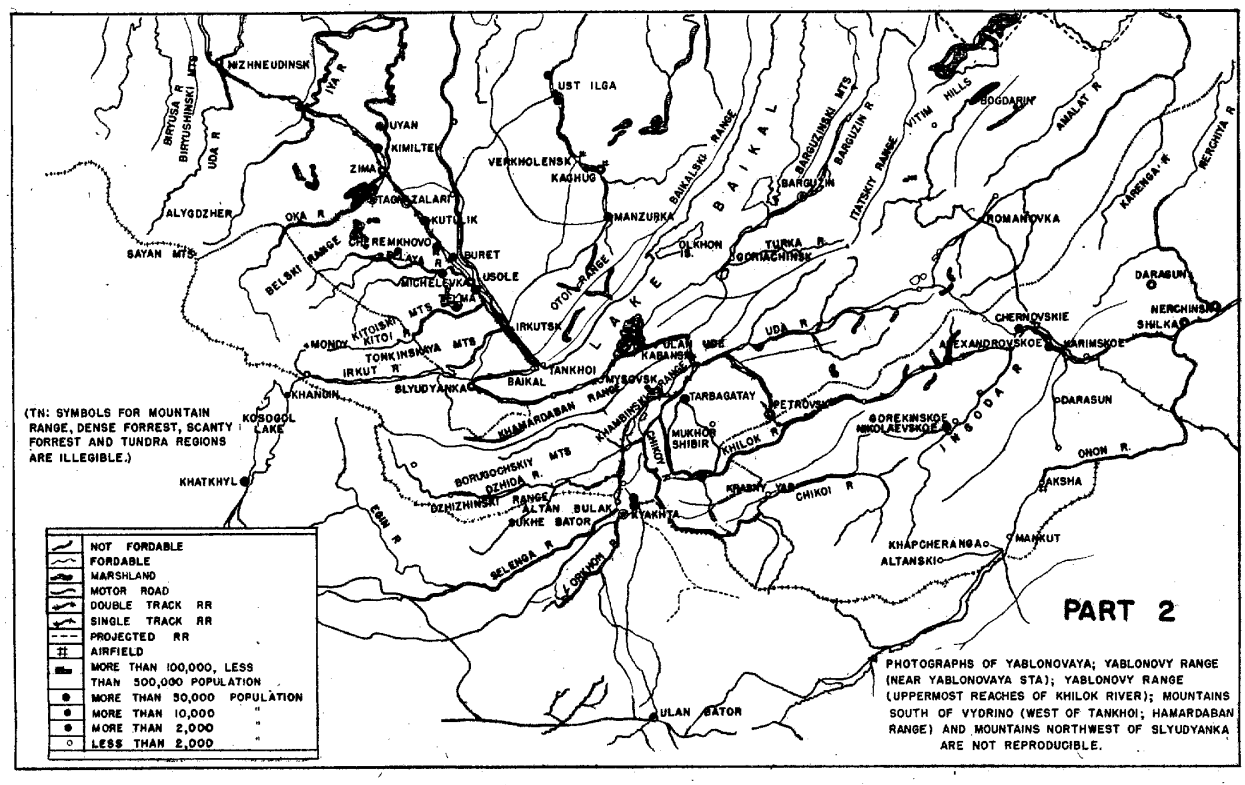
1. Topographic and Strategic Features
2. Geological Features
3. Rivers, Lakes, and Marshes
4. Lake Baikal
5. Forests, Arable Areas, and Grasslands
6. Roads and Operational Routes
7. Railroads
8. Water Transportation
9. Automobile and Regional Transportation Facilities
10. Radio Communications
11. Location of Airfields
12. Distribution of Population in Principal Cities and Towns
13. Billeting Facilities and Water Supply
14. Storage Installations for Provisions (Irkutsk Oblast)
15. Hygiene (Men and Animals)
16. Industrial Resources (Irkutsk Oblast)
17. Administrative Subdivisions and Racial Distribution

II. CHARTS

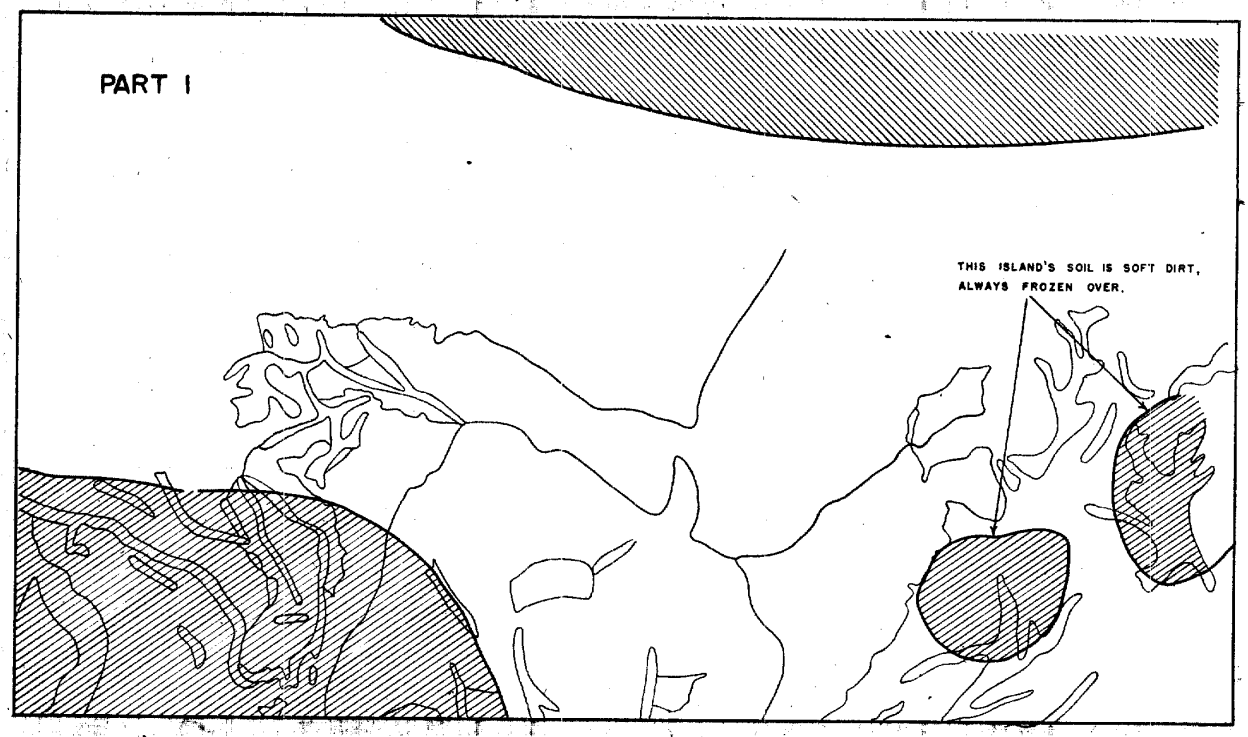
1. Air Navigation Weather
2. Average Date Limits of 0°-Centigrade Temperature
   Attached: Depth of Frozen Earth Strata
3. Average Temperature (January and July)
4. Day and Night
5. Maximum Snow Depth and Number of Days of Continuous Snow
6. Number of Foggy Days

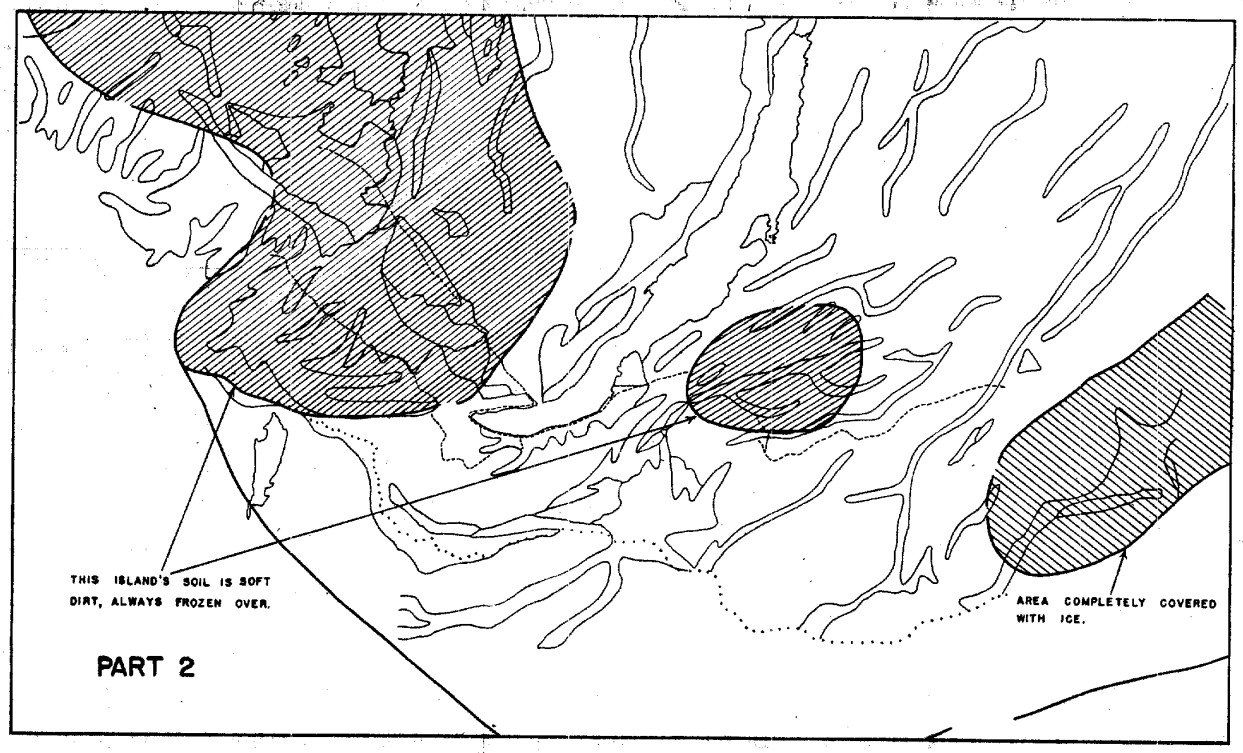
# MAP I. TOPOGRAPHIC AND STRATEGIC FEATURES



# MAP 2, GEOLOGICAL FEATURES



Map 2. GEOLOGICAL FEATURES

I. GEOLOGICAL NATURE AND DISPOSITION

A. Alluvial Soil (pebbles, gravel and clay)

This area is small in extent, confined to the banks of rivers and lakes.

1. The ground is flat, and the soil is clayey, with pebbles and gravel in the neighborhood of river beds.

2. Weather and climatic conditions very often result in wet, marshy ground.

3. Water is easily brought to the surface by sinking shallow wells.

B. Diluvial Soil

There is only a little -- on river banks.

1. The topography is generally flat, and the soil usually of clay.

2. As a climatic result, the ground dries up.

3. At surface level, water is generally not easily obtained, but is usually easy to get by sinking wells.

C. Past Accumulations (sand, rocks, pebbles, gravel, etc.)

The soil in the area west of Lake Baikal falls into this category.

1. For the most part, the higher ground of mountains and hills dries up.

2. Surface water affords the chief supply, well water not being easily obtainable.

3. In places where there are many layers of old rock, the solidification of new rock stratum often causes a process of deterioration to set in.

4. In rocks and stone having similar strata or grain, crumbling and breaking off often occurs due to water penetration, freezing, etc.

D. Igneous (Plutonic) and Metamorphic Rocks, Granite, Gneiss, Quartz-Porphyry, Quartz-Green Emerald

An area of this nature is found between the Yablonovy Mountain Range and east of Lake Baikal.

1. When the wind changes direction in areas where the soil is loose and rugged and in precipitous mountain

regions, very often the rocks deep under the soil are exposed.

2. Generally, the water which flows over granite rocks is good.

Key to Map 3

RIVERS, LAKES AND MARSHES

Part 1:

1. 750 (  )
2.1-80 (1.1) Small pebbles

2. 120-200 (  )
Shoals (0.5-0.7) (2.0-2.8) Pebbles and Stones
Gently Flow (2.0-4.0)

3. 40-80 (  )
Shoals max 0 min 0.35 (2-2.3) Pebbles and Stones

4. 800-900 (  )
4.48

4a. 1,000-1,700 (  )
2.8-5.0 (0.68) Pebbles and Stones

5. 180-320 (  )
Shoals 0.3 (1.4-1.5)
Max 4.5 (0.8-1.0)

6. 175-410 (  )
Shoals 0.95 (0.8)
Max 5.0

7. 600-2,500 (  )
Shoals 0.6-0.7 (1,6-2.4)

8. 25-100 (  )
Shoals 0.32-0.38 (0.4-0.6) Pebbles and Stones

9. 200 (  )
Shoals 0.26-0.45 (0.4-0.8) Pebbles and Stones

10. 200-300 (  )
Shoals 0.55-1.1 (2.5) Pebbles

11. 150-400 (  )
Shoals 0.6 (  ) Sand
Max 6.0

12. 300-400 (  )
Shoals 0.36-0.85 (0.7-0.8) Sand Pebbles

13. 220-575 (  )
Shoals 1.0 (0.7-0.8)
Max 10

14. 100-200 ( )
Shoals 0.7-0.9 ( )
(TN: ?) 1.1-1.5

15. 425-2,000 ( )
Shoals 2.0 (0.8)
Max 12.5

Part 2:

1. _____
Shoals 0.35-0.40 (0.5-0.6) Pebbles
Banks 1.0-.5 (0.5-1.0)

2. 100-2,000 ( )
Shoals 0.5 and over (0.55) Pebbles

3. 200-250 ( )
0.7-0.9 ( ) Pebbles

4. 100-150 ( )
Pebbles

5. 150-200 ( )
1.5-2.0 (0.5-0.9) Pebbles

6. 190 ( )
(0.5-0.9) Rocks

7. 200 ( )
Pebbles

8. 50-90 ( )
0.9-1.5 (2.5) Small Stones

9. Narrowest part 998 ( )
1.3-2.5 (1.7-2.3) Pebbles

10. 50 ( )
1. ( ) Sand

11. 30 ( )
1. (Slow ) Muddy but potable

12. 500 ( )
1.5-2.0 (0.5) Sand

13. 65-100 ( )
Shoals 0.2-0.3 ( )
Slow-flowing parts 2-3 ( )

14. 80-140 ( )
1.4-4.0 (1.0-1.8)

15. 100-130 ( )
2. (1.5-2) Pebbles

16. 85-220 ( )
1.7-3 (1.3) Pebbles

17. 150-200 ( )
Very Large Good Stones

18. 95-216 ( )
2.2-5.9 (1-2)

19. 210-400 ( )
2.5-4.0 ( ) Sand, stones

20. 100-200 ( )
1.2-3.0 ( ) Sand, stones

21. 80-560 ( )
2.4-4.5 (1.5-2.0)

22. 100 ( )
1.5-2.0 ( )

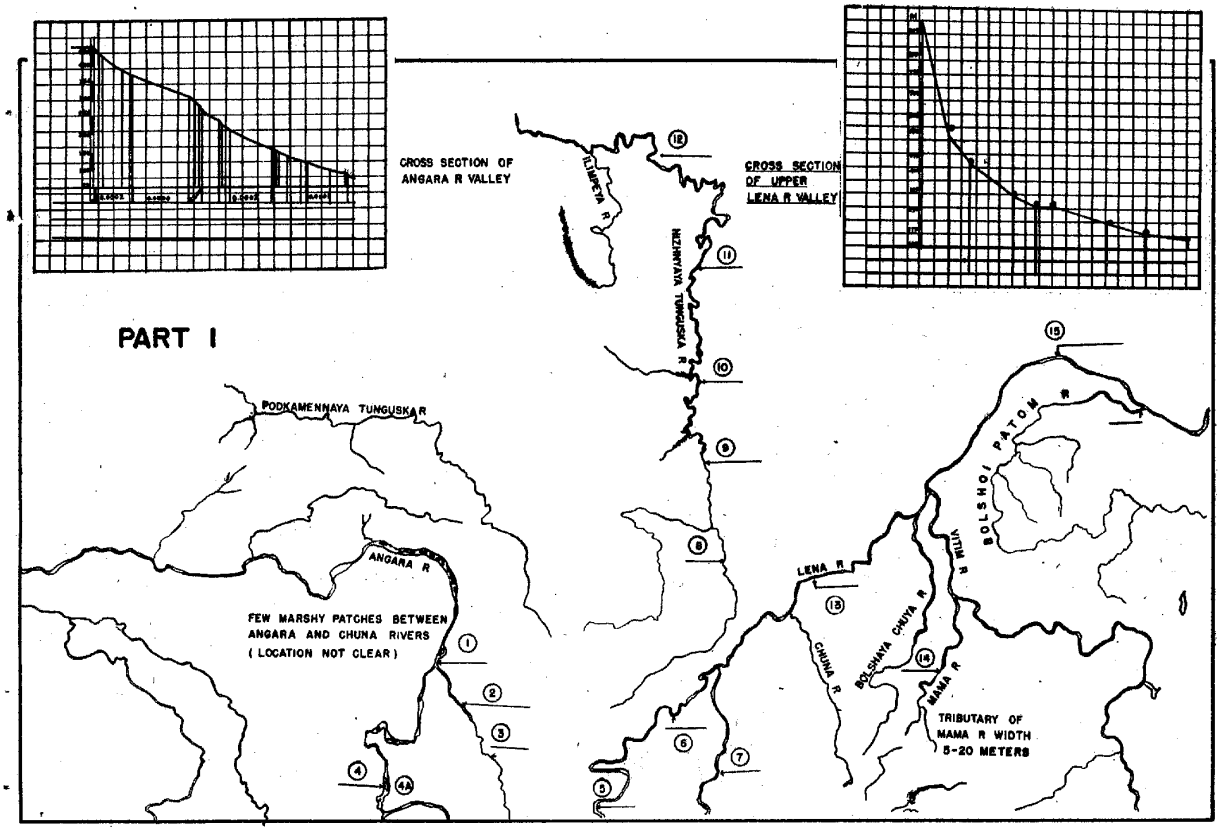
23. 120-550 ( )
2.7-5.0 (1.0)

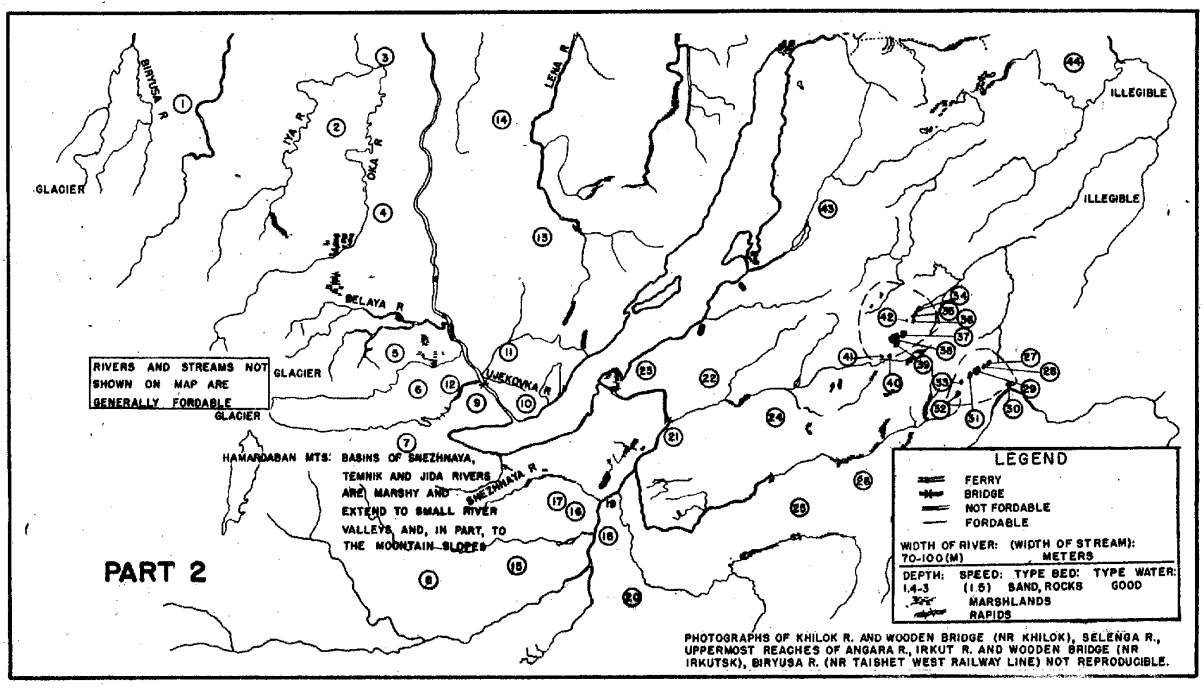
24. 70-80 ( )
0.7-1.0 (Slow) Sand

25. 90 ( )
1.0-2.1 (1.0-2.5)

26. 85-130 ( )
1.5-3.0 (1.8-2.0) Small Pebbles

# MAP 3. RIVERS, LAKES, AND MARSHES

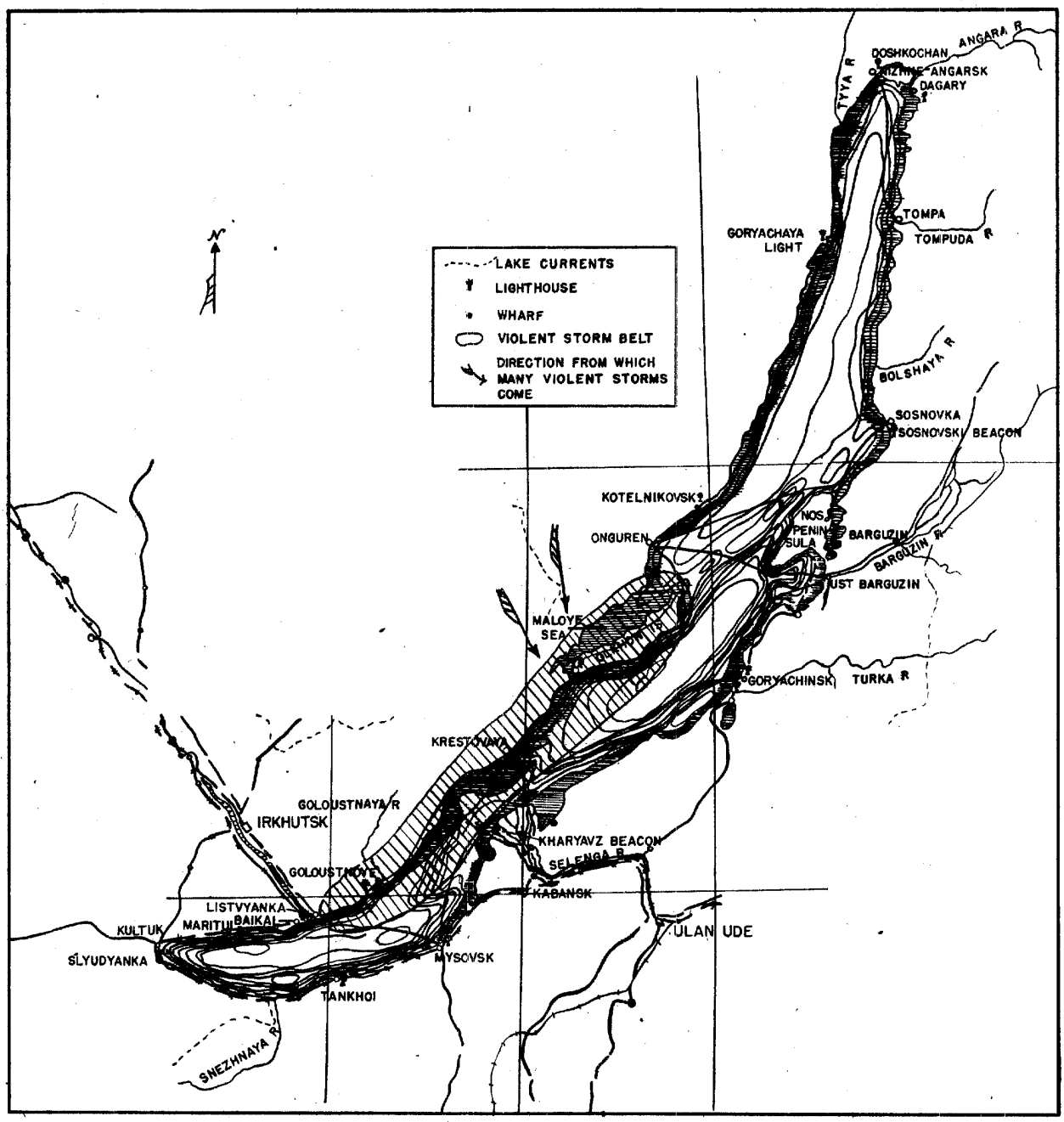



PHOTOGRAPHS OF KHILOK R. AND WOODEN BRIDGE (NR KHILOK), SELENGA R., UPPERMOST REACHES OF ANGARA R., IRKUT R. AND WOODEN BRIDGE (NR IRKUTSK), BIRYUSA R. (NR TAISHET WEST RAILWAY LINE) NOT REPRODUCIBLE.

CPYRGHT

# MAP 4. LAKE BAIKAL




NOTES: 1. OBSERVATION OF STORMS WAS MADE OVER THE COMPARATIVELY SHORT PERIOD OF 3-5 YEARS.

2. OBSERVATION OF VIOLENT WINDS FROM ALL FOUR COMPASS POINTS WAS MADE OVER A PERIOD OF 3 YEARS (1900-02), AND THE AVERAGE WIND VELOCITY WAS CONSIDERED TO BE BETWEEN 15-40 METERS PER SECOND.

3. ESTIMATE ON NUMBER OF FOGGY DAYS IS BASED ON AN AVERAGE PERIOD OF 8 YEARS (1896-1903).

Map 4. LAKE BAIKAL

I. GENERAL INFORMATION

A. Dimensions

Length: 636 kilometers
Width at widest point: 79.4 kilometers
Average width: 47.8 kilometers

B. Area:

31,500 square kilometers (7th largest in world)

C. Formation

The lake was formed by a cave-in of earth due to a terrestrial upheaval or some other extraordinary geographical phenomenon.

D. Undulation and Depth of Lake Bed

The three most important levels:

1. South: The deepest part, 1,447 meters, is near Cape Berezov.

2. North: The greatest uniform depth is over 800 meters. The deepest part, 983 meters, is in the neighborhood of Kotelnikov promontory.

3. Central: This vast area of 1,741 meters in extent is over 1,600 meters in depth and is one of the largest in the world.

E. Rivers

1. A total of 336 rivers empty into the lake, among the largest being the Selenga, Barguzin, Verkhne, Angara and Turka Rivers.

2. Flowing out of the lake is the Angara.

F. Length of the Shoreline:

2,000 kilometers (1,999.8 kilometers); degree of expansion, 3.4.

G. Islands

There is a total of 16 islands, the largest being Oklhon Island, 742.22 square kilometers in area.

H. Delta Land:

At the mouths of the Selenga and Angara Rivers.

I. Lake Bed:

Mud, rocks and stones.

J. Storms

The lake is famous for its storms, which have their origin in the Black Sea and the Sea of Azov. The lake, however, surpasses both these points of origin in the number of storms it experiences. The highest percentage of stormy days over a monthly period in the Black Sea is 10.9 and, in the Sea of Azov, it is 14.6; but in Lake Baikal, south of Olkhon Island, the percentage is 60. The wind, however, is only considered to be between 15-40 meters per second.

K. Fog and Mist

Fog and mist are not experienced with uniformity. Areas where it is most frequently experienced are: Listvyanka, Ushkani, Barguzin, etc.

L. Flow of the Lake

The general flow of the lake is from the confluence of the Selenga River around to the south, crossing over to the southwest banks and following around to the southeast bank in a northeasterly direction as far as the southern shore of the Selenga Delta, which divides the southern part of Lake Baikal from the northwest section. Another current emanates from the Barguzin River in the direction of the Ushkani Island area from the Nos Peninsula for a distance of about 0.5 kilometers at a width of 5-6 kilometers.

These lake currents are usually experienced at a depth of between 10-20 meters and vary according to circumstances in each area and according to the wind, full moon, and the strength of the current in the river mouth. There are particularly strong currents in the straits near Olkhon Island.

M. Nature of the Water:

Deep and very clear.

N. Freezing Over

Ice begins to form along the lake shore in November and depends on position and local characteristics; ice banks, however, generally form along the east shore of the lake. These ice formations vary in size from 0.5-6.0 meters (1.0 meters in the Slyudyanka region, 5 meters in the Cape Mysovsk region, and 6 meters north of the Selenga River).

The lake surface freezes over on cold, windless days, but the ice is frequently broken up again. The time when the whole surface freezes over varies from place to place around the lake, also from year to year. The earliest-recorded freeze-over was 30 Nov 1905 in the Listvyanka

region (not including the Maloye Sea and Kopilagorova area): the latest was 22 Feb 1892 in the Goloustnoye.

O. Thawing Conditions

Thaw does not set in simultaneously, but varies according to each locality. After the thaw, the ice is driven along the lake by spring winds and lake currents, and masses in a fixed place, particularly on the east bank. It thaws by degrees and so permits a resumption of navigation.

P. Navigational Periods

Periods suitable for navigation vary according to the special characteristics of each locality. (See the table on Lake Navigation Period.)

Q. Cracks and Holes in Ice

The phenomenon of cracks and holes is a very common one and is distributed over a wide area. The holes are 1 or more meters in width and form at the beginning of every freeze-over; and, although the cracks freeze over again quickly, there are always some left over at the end of the cold-weather season.

The holes form in identical places every year and, as they are covered by thin ice, they make walking across difficult. Because of the danger of sinking, it is very dangerous to walk across the ice on Lake Baikal. The holes are caused by gases present on the lake bed, similar to springs on land. They generally appear in February and increase in number during the spring, when those already in existence increase in size. In crossing the lake, caution must be displayed, particularly at night, since some of the holes expand in diameter to 10 or more meters.

Statistics on Storms, Wind Direction and No of Foggy Days

| Place | Wind Direction | Number of Storms Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kultuk | N 3, NNW 1 | 1 | 0 | 4 | 6 | 8 | 6 | 2 | 3 | 3 | 2 | 3 | 3 | 41 |
| Lysovsk | W 24, WNW 10, NW 12, S 5 | 7 | 3 | 4 | 8 | 6 | 5 | 7 | 8 | 10 | 9 | 15 | 10 | 92 |
| Turkinski Lighthouse | W 5, NW 2, WNW 1 | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 9 | 2 | 0 | 1 | 0 | 27 |
| Ushkani I. | S 10, SE 7, SSW 6, SW 4 | 10 | 6 | 0 | 0 | 4 | 12 | 6 | 3 | 1 | 3 | 12 | 6 | 63 |
| Doshkochan | NNE 12, N 6, NE 2 | 2 | 4 | 10 | 9 | 10 | 12 | 0 | 4 | 2 | 12 | 2 | 3 | 70 |
| Kobilyakorova | NNW 100, NW 144, N 27, NNE 12 | 33 | 44 | 41 | 40 | 49 | 2 | 29 | 36 | 40 | 51 | 57 | 60 | 482 |
| Bezymannaya Bay | SSE 13, NW 35, NNW 25, WNW 10, N 2 | 9 | 8 | 14 | 10 | 14 | 8 | 2 | 11 | 9 | 13 | 11 | 17 | 126 |
| Goloustnoye | NW 23, NNW 2 | 10 | 13 | 17 | 13 | 17 | 7 | 3 | 5 | 11 | 8 | 11 | 15 | 133 |
| Listvenichny | N 10, NW 2, S 2 | 15 | 11 | 19 | 19 | 21 | 10 | 6 | 12 | 17 | 13 | 14 | 14 | 171 |





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Number of Navigable Days on Lake Baikal

| Place | No Years Observed | Min Per | Max Per | Avg | No Years Observed | Thin-nest | Thick-est | Avg |
|---|---|---|---|---|---|---|---|---|
| Listvenichny | 21 | 187 | 293 | 240 | 8 | 36 | 120 | 94 |
| Goloustnoye | 9 | 186 | 253 | 219 | 11 | 69 | 107 | 90 |
| Bezymennaya | 1 | 199 | 199 | 199 | 15 | 68 | 109 | 87 |
| Kobalyakorova | 6 | 170 | 193 | 181 | 19 | 41 | 124 | 96 |
| Kotelnikovski | 8 | 177 | 198 | 183 | 8 | 64 | 110 | 84 |
| Lighthouse Doshkochan | 2 | 184 | 218 | 201 | 4 | 87 | 124 | 110 |
| Lighthouse Dagary | 3 | 191 | 203 | 192 | 3 | 107 | 125 | 119 |
| Lighthouse Sosnovka | 2 | 182 | 197 | 189 | - | - | - | - |
| Lighthouse Goriyachinski | 1 | 169 | 169 | 169 | - | - | - | - |
| Lighthouse Turkinski | 3 | 178 | 194 | 188 | 16 | 58 | 136 | 105 |
| Kharauz | 12 | 193 | 250 | 226 | 15 | 67 | 132 | 108 |
| Mysovsk | 1 | 205 | 205 | 205 | 3 | 70 | 106 | 90 |
| Maritui | 2 | 226 | 236 | 231 | 7 | 67 | 113 | 91 |
| Ushkani Island | 10 | 184 | 224 | 201 | 18 | 65 | 130 | 106 |







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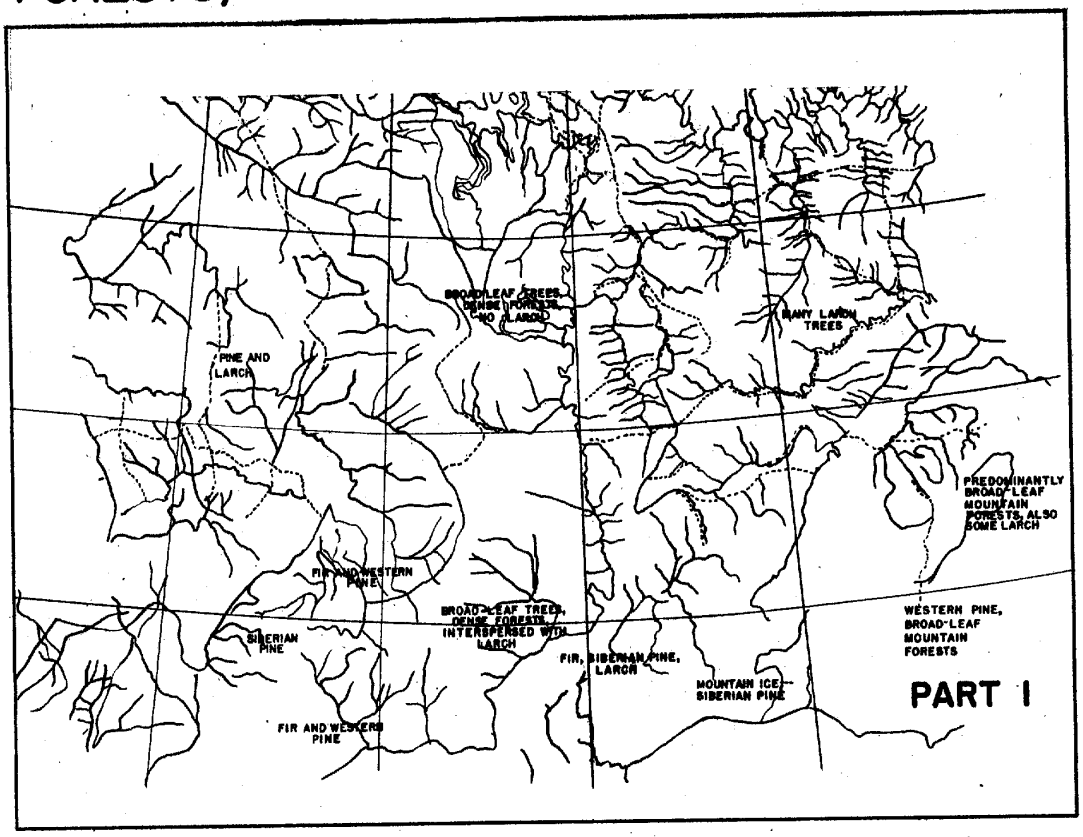
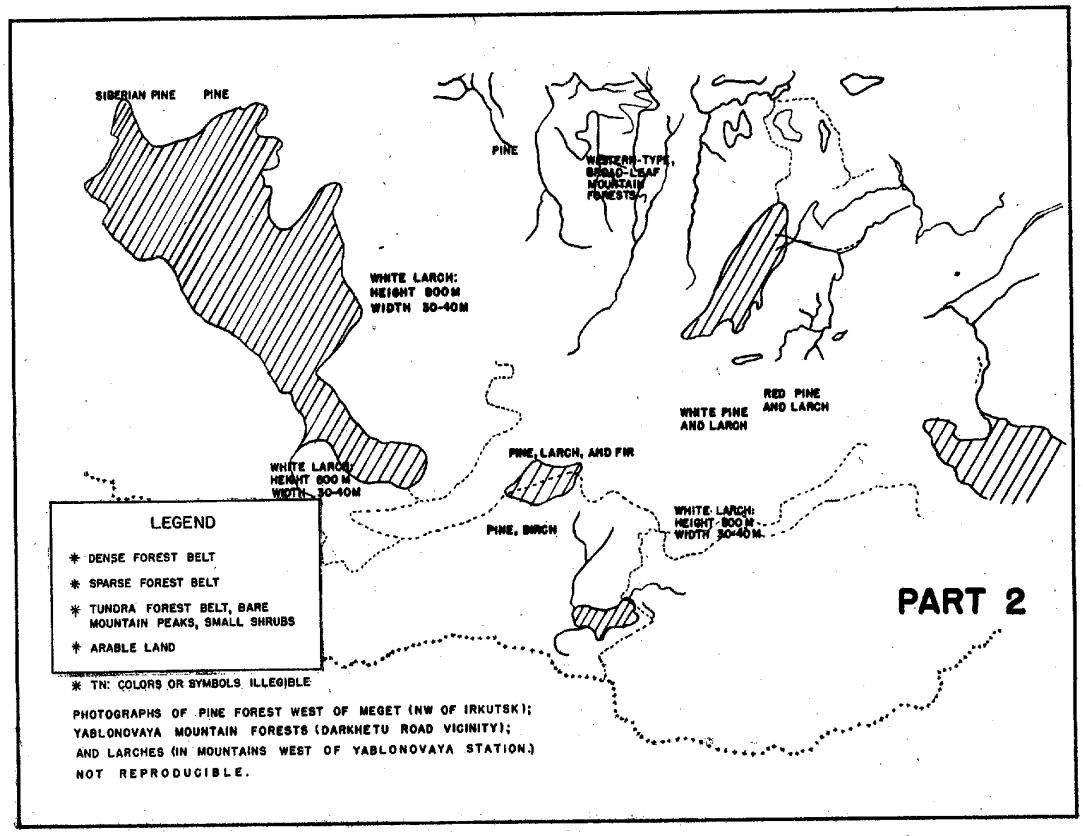
# MAP 5.

## FORESTS, ARABLE AREAS AND GRASSLANDS




* TN: COLORS OR SYMBOLS ILLEGIBLE

PHOTOGRAPHS OF PINE FOREST WEST OF MEGET (NW OF IRKUTSK); YABLONOVAYA MOUNTAIN FORESTS (DARKHETU ROAD VICINITY); AND LARCHES (IN MOUNTAINS WEST OF YABLONOVAYA STATION.) NOT REPRODUCIBLE.

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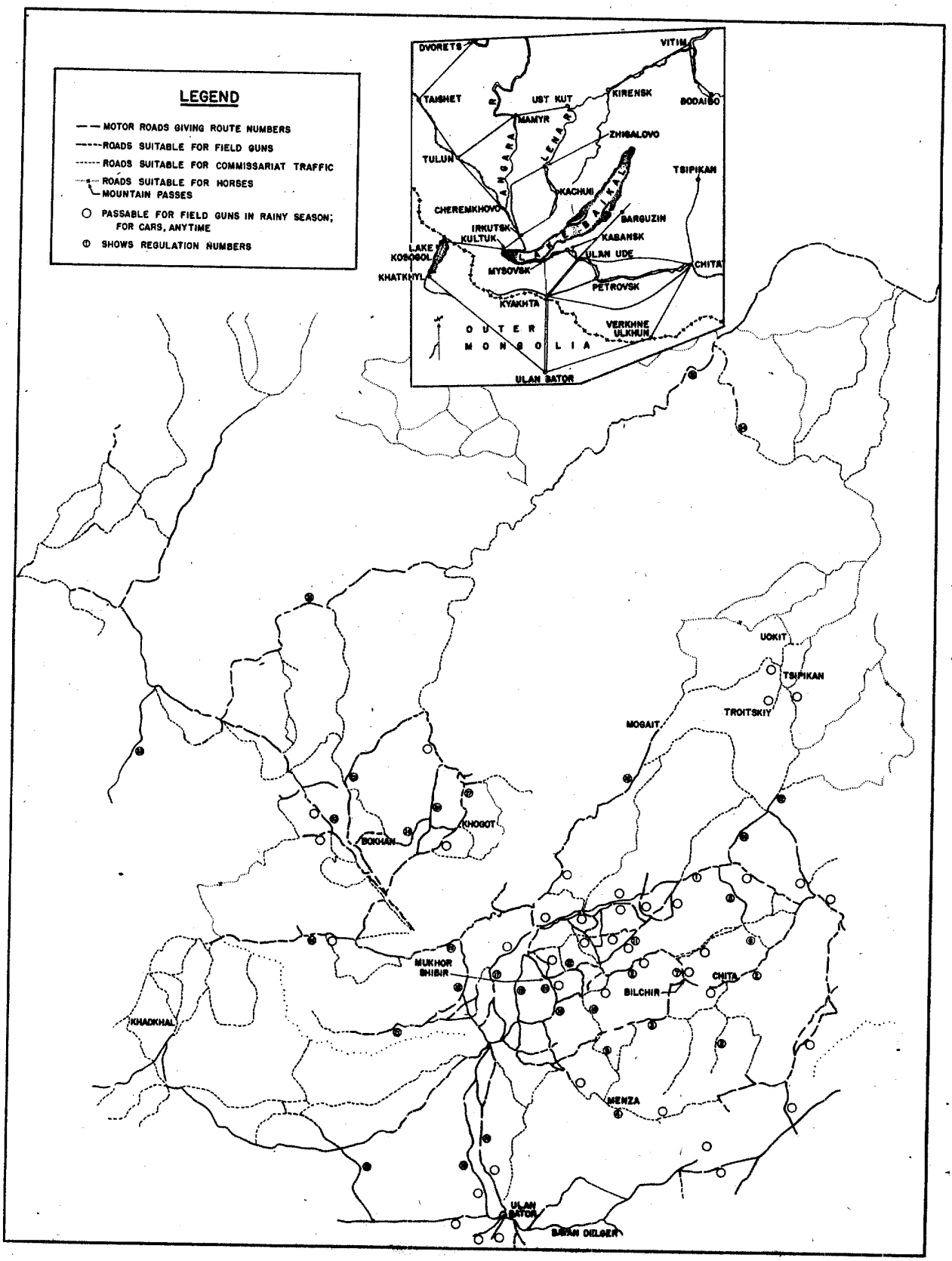
# MAP 6. ROADS AND OPERATIONAL ROUTES



Map 6. ROADS AND OPERATIONAL ROUTES

## I. EAST OF LAKE BAIKAL

### A. Roads Between Chita and Basin of Selenga River

1. East-west highway through Yablonovaya Mountains:

| | | |
|---|---|---|
| a. | Chita-Sasnovozerskoe-Ulan Ude | 442 kms |
| b. | Ingoda-Khilok-Petrovsk-Ulan Ude | 480 " |
| c. | Chita-Ulety-Yamarovka-Krasny | 504 " |
| d. | Bukukun-Ashinga-Menza-Khilkotoi | 275 " |

2. Roads connected with the above:

| | | |
|---|---|---|
| a. | Mogon-Sasnovozerskoe | 95 " |
| b. | Ulety-Mogzon | 65 " |
| c. | Bilchir-Khilok | 58 " |
| d. | Tanga-Ingoda River Valley-Bokukun | 264 " |
| e. | Menza-Krasny | 185 " |
| f. | Maleta-Krasny | 65 " |

### B. Outer Mongolia

1. From Ulan Bator to Soviet-Mongolian Frontier:

| | | |
|---|---|---|
| a. | Ulan Bator-Altan Bulak (New Road) | 356 " |
| b. | Ulan Bator-Altan Bulak (Old Road) | 360 " |
| c. | Ulan Bator-Bulagan-Khatkhyl | 700 " |

### C. Soviet Territory

1. Roads following the railroad from the frontier:

| | | |
|---|---|---|
| a. | Kyakhta-Kiranski-Novo Seleginski-Ulan Ude | 225 " |
| b. | Kyakhta-Ust Kyakhta-Mysovsk-Ulan Ude | 304 " |
| c. | Kyakhta-Kiranski-Tarbagatai-Ulan Ude | 285 " |
| d. | Malokudara-Bichura-Tarbagatai-Ulan Ude | 262 " |
| e. | Jida-Jida River Valley-Ust Kyakhta | 260 " |

2. Roads north from the railroad:

| | | |
|---|---|---|
| a. | Chita-Romanovkaya | 390 " |
| b. | Sasnovozerskoe-Romanovka | – |
| c. | Ulan Ude-Barguzin-Nogait | 390 " |

## II. WEST OF LAKE BAIKAL

### A. Road Following Railroad

| | | |
|---|---|---|
| a. | Ulan Ude-Mysovsk-Kultuk-Irkutsk-Zima-Taishet | 621 " |

B. Roads Following Banks of the Angara-Uda Rivers

| | | |
|---|---|---|
| a. | Irkutsk-Kachug-Zhigalovo | 360 kms |
| b. | Irkutsk-Balagansk-Zhigalovo | - |
| c. | Irkutsk-Malyshevka-Zhigalovo | 370 " |
| d. | Tulun-Bratsk-Mamyr-Ust Kut | 500 " |

Map 7. RAILROADS

A. History of Their Establishment

In 1869, the head of the Siberian government, Walushichyov, announced plans for the construction of a railroad across Siberia, and in 1892, after many changes, construction began at Cheryabinsk, reaching, by 1898, the Baikal Station on the shores of Lake Baikal. The construction of track lines around the lake, considered the most difficult factor, was left until later. This construction continued from Mysovaya, on the bank opposite Baikal Station, and reached Sretensk in 1900. The line encircling Lake Baikal was completed in 1904.

During the Russo-Japanese War, this railway was the Soviet's main line of transportation and has been greatly developed in recent years.

B. History of Administration and Management

West of Lake Baikal, the line has been managed by the East Siberian Railroad and, east of Lake Baikal, separately managed by the Transbaikal Railroad; but, in 1936, these two were combined, and the line between Taishet and Petrovsk is now called the East Siberian Line, while from Petrovsk to Ksenyevskaya, the Molotov Line. However, in Oct 1942, the Molotov Line was renamed Transbaikal.

C. Yearly Progress

| Between: | Work Began: | Was Completed: |
|---|---|---|
| Oby and Irkutsk | 1893 | 1896 |
| Irkutsk and Baikal | 1896 | 1896 |
| Baikal and Mysovaya | 1899 | 1904 |
| Mysovaya and Sretensk | 1895 | 1900 |

The Naushinski Branch Line work began in 1939 and was completed the same year. The double tracks on the main line of the Siberian Railroad was completed up to Karymskaya by 1912, work having been resumed immediately after the Russo-Japanese War.

D. Military and Economic Value

Between Taishet and Jida, this railway across Siberia connects European Russia and Asiatic Russia and is important for the transportation of supplies for military defence and as a lifeline for the development of industry. The branch line which enters Outer Mongolia is the main supply line for the Soviet Army in Mongolia and the artery of Soviet planning in that country. In this area is the Cheremkhovo coal field, with a yearly output of 5,000,000 tons, and the Angara industrial zone which, based on plans to include Irkutsk, Usole and Cheremkhovo, is in the process of immediate establishment. Supply lines between Ulan Ude,

Kultuk, the Manchurian branch line at Borzya, and Outer Mongolia carry 2,000,000 tons of livestock, fur, wool, hides, etc.

E. Building of Branch Lines

The branch line from Zaujinski to Naushinski on the Russo-Mongolian border, which branches off into a detour at the west end of Lake Gusinoye, was completed Feb 1939. This line was extended into Outer Mongolia, passing through Altan Bulak, and was intended to reach Ulan Bator, but the sudden outbreak of the Russo-German War caused work on the project to practically cease. A short connecting line around Lake Baikal connects Irkutsk and Kultuk, and, although there are plans to extend this line also into Outer Mongolia in the Khatkhyl area on the shores of Lake Kosogol, the progress of the actual work is not known.

F. Building of the Lena Railroad

Work on the Lena main line to the Kirensk region, passing through Ust Kut from a branch out of Taishet, was completed under the stimulus of changed conditions in the East and Manchurian independence. Plans were changed, and, in a burst of engineering zeal, construction was begun on a Baikal-Amur railroad to Sovetskaya Gavan, running east to join with the Siberian main line, starting at Ust Kut and running via the northern edge of Lake Baikal. However, the Russo-German War intervened, and, at present, the work has been suspended; but the section between Taishet and Bratsk was open for traffic before the war broke out.

G. Special Features of the Permanent Line

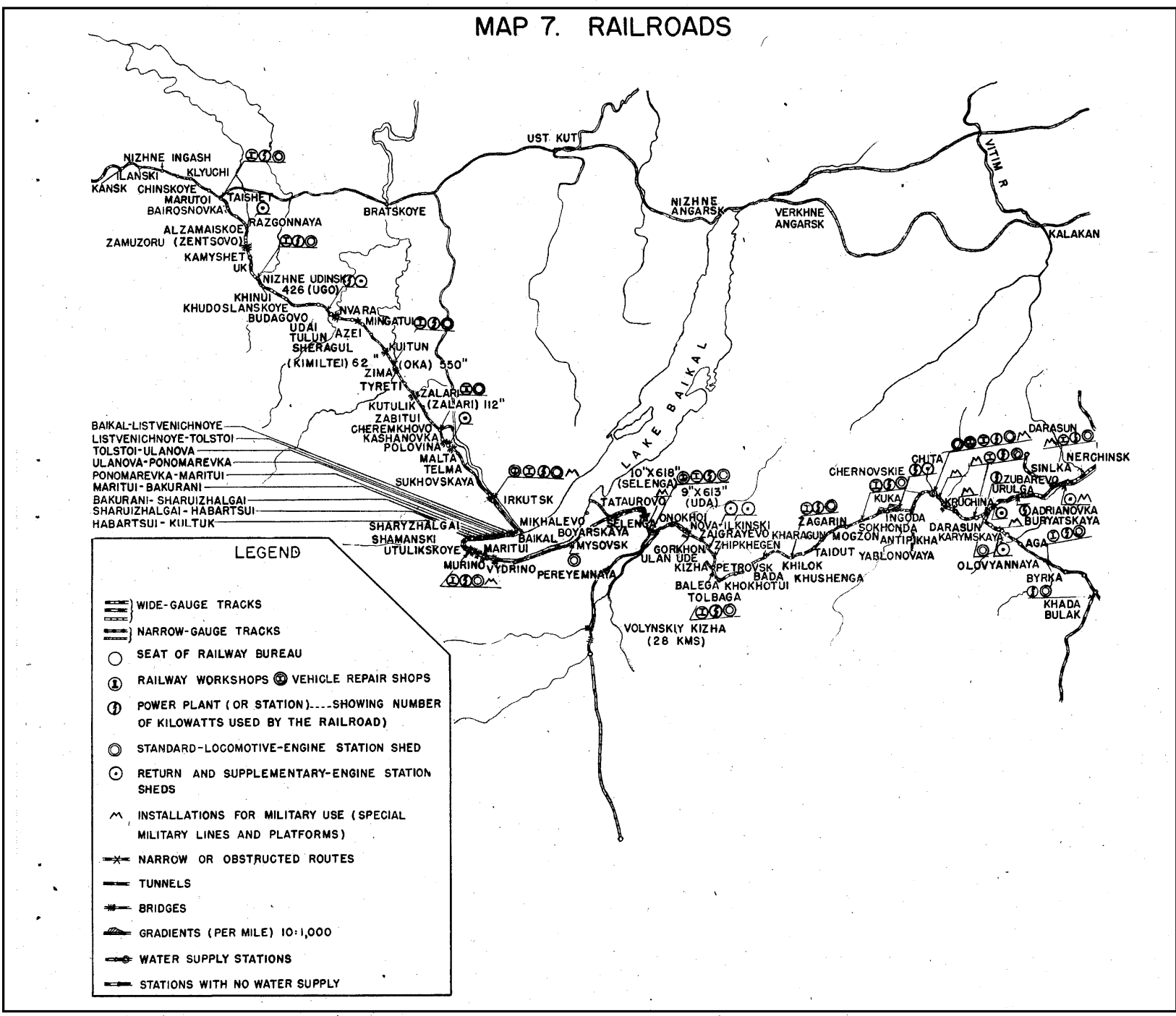
1. Between Chita and Slyudyanka:

This line crosses the Mongolian Plateau in the Yablonovaya and Kizha region and has the steepest gradient of 17.4:1,000. Apart from the large bridge over the Selenga River, there are no large hazardous bridges, but dangerous places are found west of Mysovaya, where there are many temporary bridges over swampy ground, also lakeside bridges.

2. Between Slyudyanka and Irkutsk:

This line, which branches off around Lake Baikal, is treacherous and difficult, since it runs through the precipitous mountain terrain on the north shore and through many tunnels; and there are many accidents due to the damaging of tracks by falling rocks, etc.

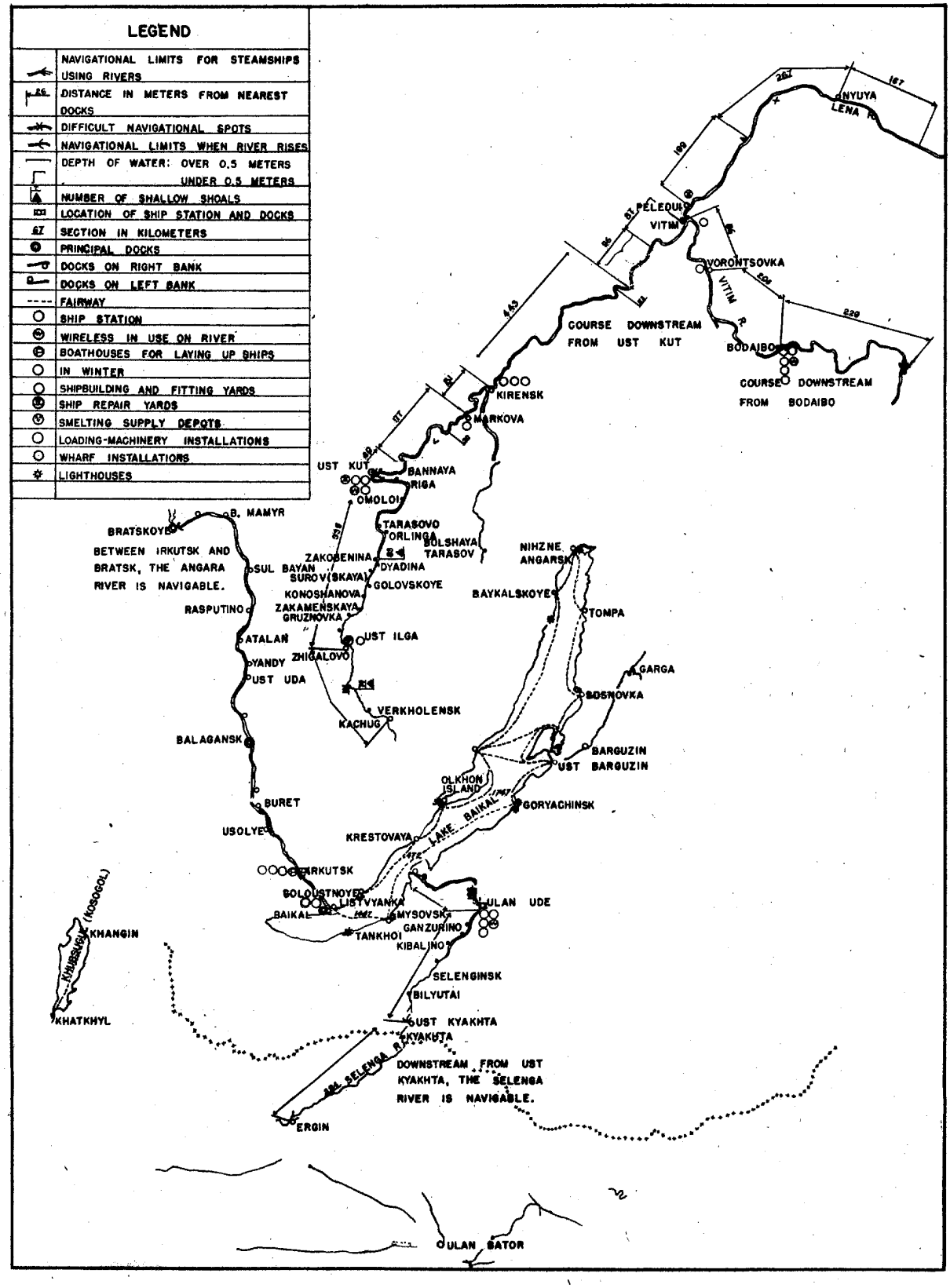
# MAP 7. RAILROADS



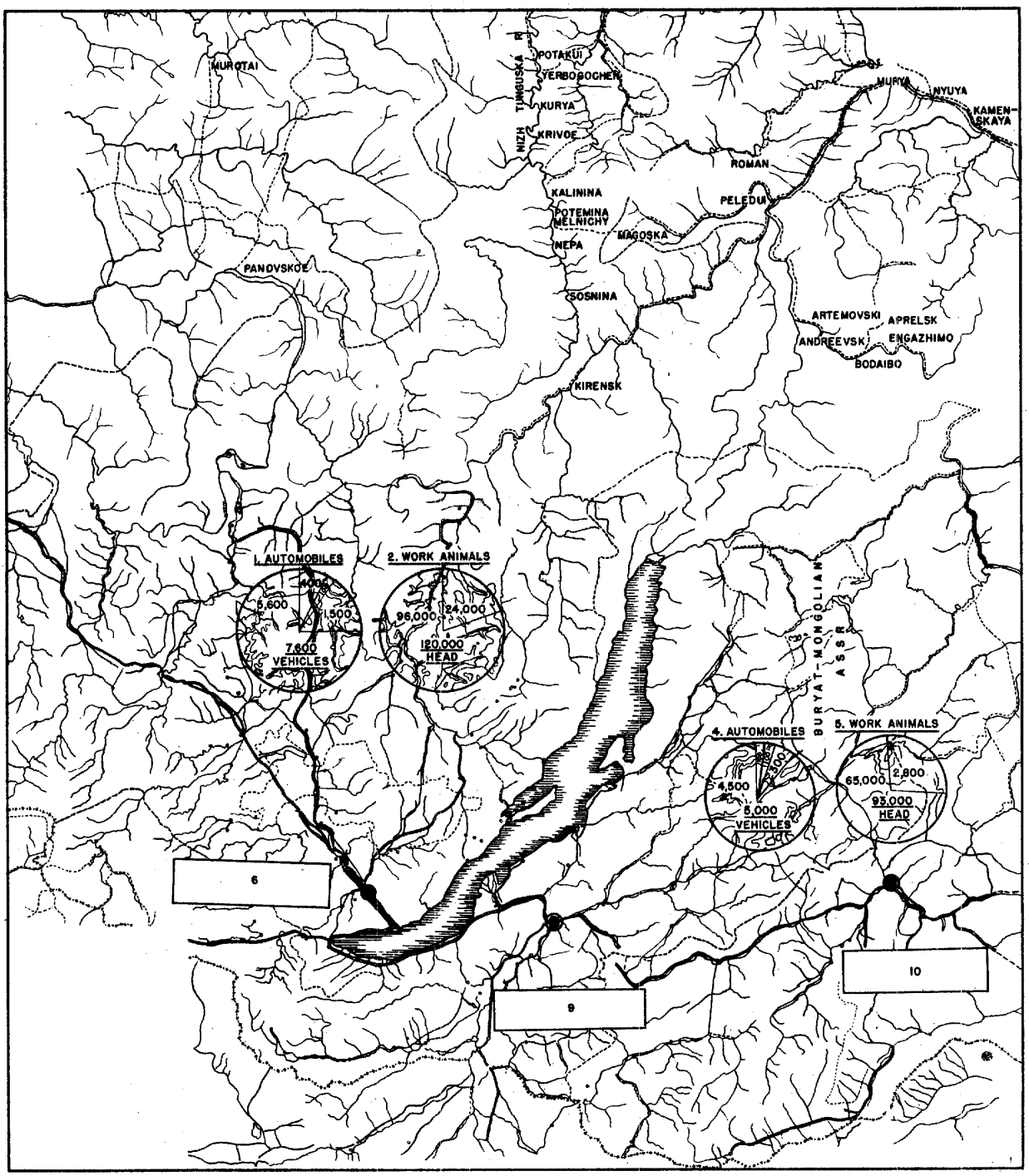
3. Between Irkutsk and Taishet:

This area in the so-called Siberian High Plateau region has many undulations, twists and turns, and passes not suitable for fast trains. Forests cover wide areas, and over the Oby and Uda Rivers are bridges of considerable size. Ice hazards are experienced on this line, the winter season being very severe, and there are many places where the temperature drops 50° below zero. Many accidents and resultant injuries occur on the icy bends of track.

# MAP 8. WATER TRANSPORTATION

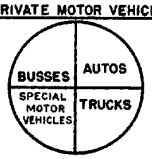


# MAP 9. AUTOMOBILE AND REGIONAL TRANSPORTATION FACILITIES



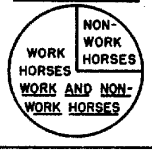

## LEGEND

7. PRIVATE MOTOR VEHICLES




NOTE: FIGURES INSIDE DIAGRAMS 1 AND 4 INDICATE NUMBER OF DIFFERENT TYPES OF VEHICLES.

8. WORK ANIMALS




NOTE: FIGURES INSIDE DIAGRAMS 2 AND 5 INDICATE NUMBER OF WORK AND NON-WORK HORSES.

SHOWS FUEL SUPPLY BASES

6

| TYPE FACTORY | PRODUCTION | MONTHLY |
|---|---|---|
| AUTO REPAIR | AUTO REPAIRS AND ENGINE MFG | AUTOS 250 ENGINES 10 |
| AUTO REPAIR | AUTO REPAIRS | 100 |
| AUTO REPAIR | AUTO REPAIRS | 100 |

9

| TYPE FACTORY | PRODUCTION | MONTHLY REPAIR CAPACITY |
|---|---|---|
| AUTO REPAIR | AUTO REPAIRS | 200 AUTOS |
| AUTO REPAIR | AUTO REPAIRS | 50 AUTOS |
| AUTO REPAIR | AUTO REPAIRS | 100 AUTOS |

10

| TYPE FACTORY | PRODUCTION | MONTHLY REPAIR CAPACITY |
|---|---|---|
| NO 1 AUTO REPAIR | AUTO REPAIRS | 100 AUTOS |
| AUTO AND TRACTOR PARTS | | |
| AUTO REPAIR | AUTO REPAIRS AND ACCESSORIES MFG | |

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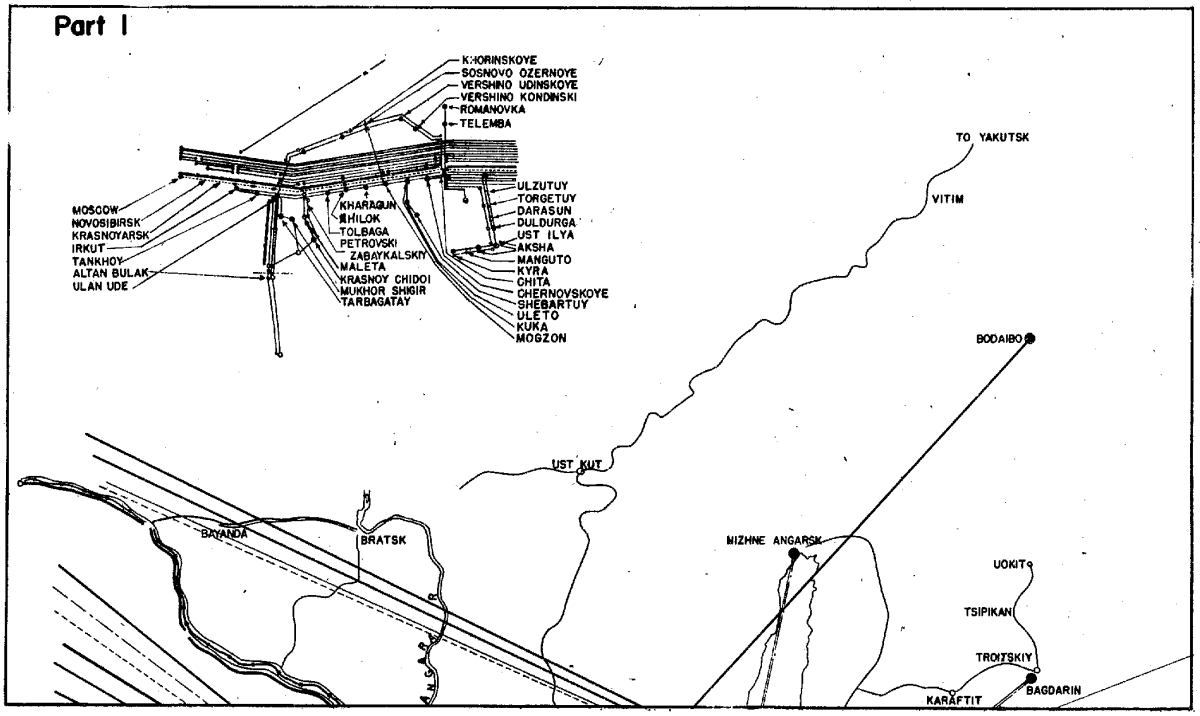
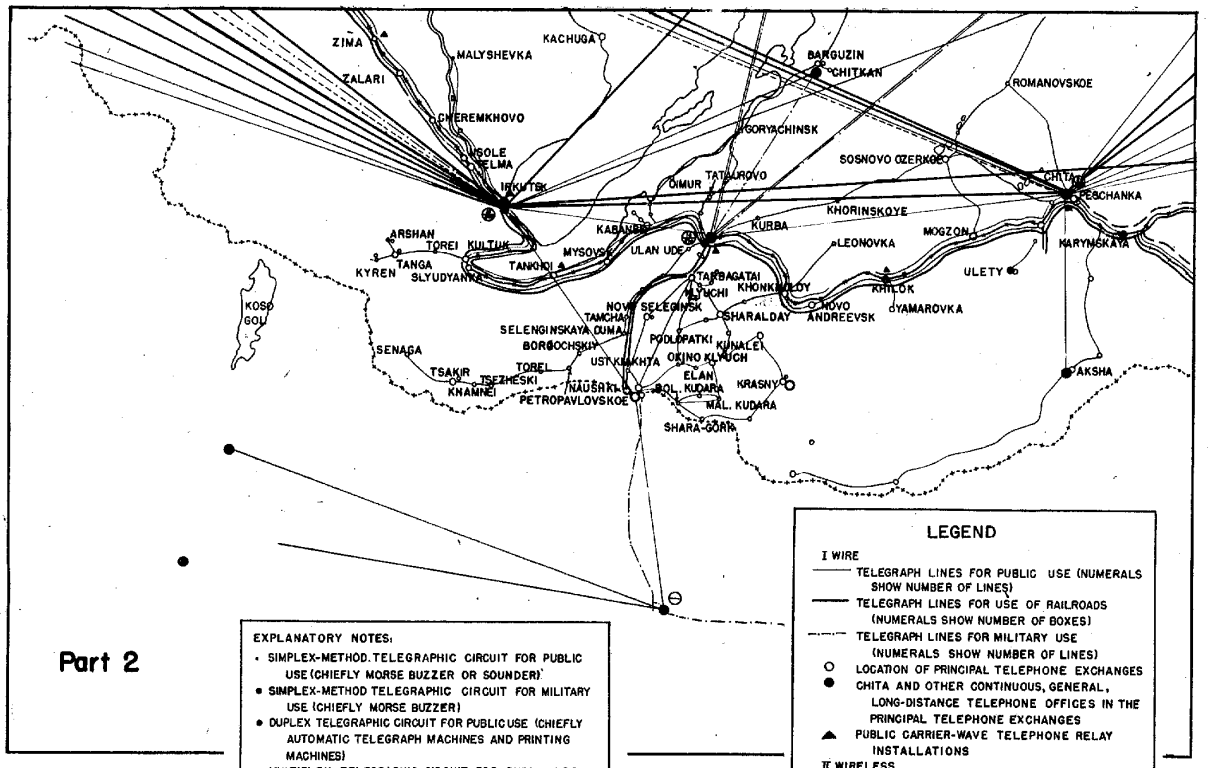
# MAP IO. RADIO COMMUNICATIONS




EXPLANATORY NOTES:

- SIMPLEX-METHOD TELEGRAPHIC CIRCUIT FOR PUBLIC USE (CHIEFLY MORSE BUZZER OR SOUNDER)
- SIMPLEX-METHOD TELEGRAPHIC CIRCUIT FOR MILITARY USE (CHIEFLY MORSE BUZZER)
- DUPLEX TELEGRAPHIC CIRCUIT FOR PUBLIC USE (CHIEFLY AUTOMATIC TELEGRAPH MACHINES AND PRINTING MACHINES)
- MULTIPLEX TELEGRAPHIC CIRCUIT FOR PUBLIC USE (CONSTRUCTION OF SOUND-FREQUENCY MULTIPLEX CIRCUITS BETWEEN KHABAROVSK AND MOSCOW)
- TELEPHONE-EXCHANGE INSTRUMENTS FOR PUBLIC USE
- TELEPHONE-EXCHANGE INSTRUMENTS FOR MILITARY USE
- TELEPHONE INSTRUMENTS FOR PUBLIC USE
- TELEPHONE INSTRUMENTS FOR MILITARY USE
- CARRIER-TYPE TELEPHONE CIRCUITS
- CARRIER-TYPE CIRCUIT RELAYS BETWEEN KHABAROVSK AND MOSCOW

LEGEND

I WIRE
- TELEGRAPH LINES FOR PUBLIC USE (NUMERALS SHOW NUMBER OF LINES)
- TELEGRAPH LINES FOR USE OF RAILROADS (NUMERALS SHOW NUMBER OF BOXES)
- TELEGRAPH LINES FOR MILITARY USE (NUMERALS SHOW NUMBER OF LINES)
- LOCATION OF PRINCIPAL TELEPHONE EXCHANGES
- CHITA AND OTHER CONTINUOUS, GENERAL, LONG-DISTANCE TELEPHONE OFFICES IN THE PRINCIPAL TELEPHONE EXCHANGES
- PUBLIC CARRIER-WAVE TELEPHONE RELAY INSTALLATIONS

II WIRELESS
- HIGH-SPEED TELEGRAPH
- LOW-SPEED TELEGRAPH
- TELEGRAPHIC TRANSMISSION OF PHOTOGRAPHS
- TELETYPE
- TELEPHONE
- WIRELESS STATION
- RADIO STATION: NUMERALS SHOW KILOWATT OUTPUT, WAVE LENGTH NOT YET DETERMINED

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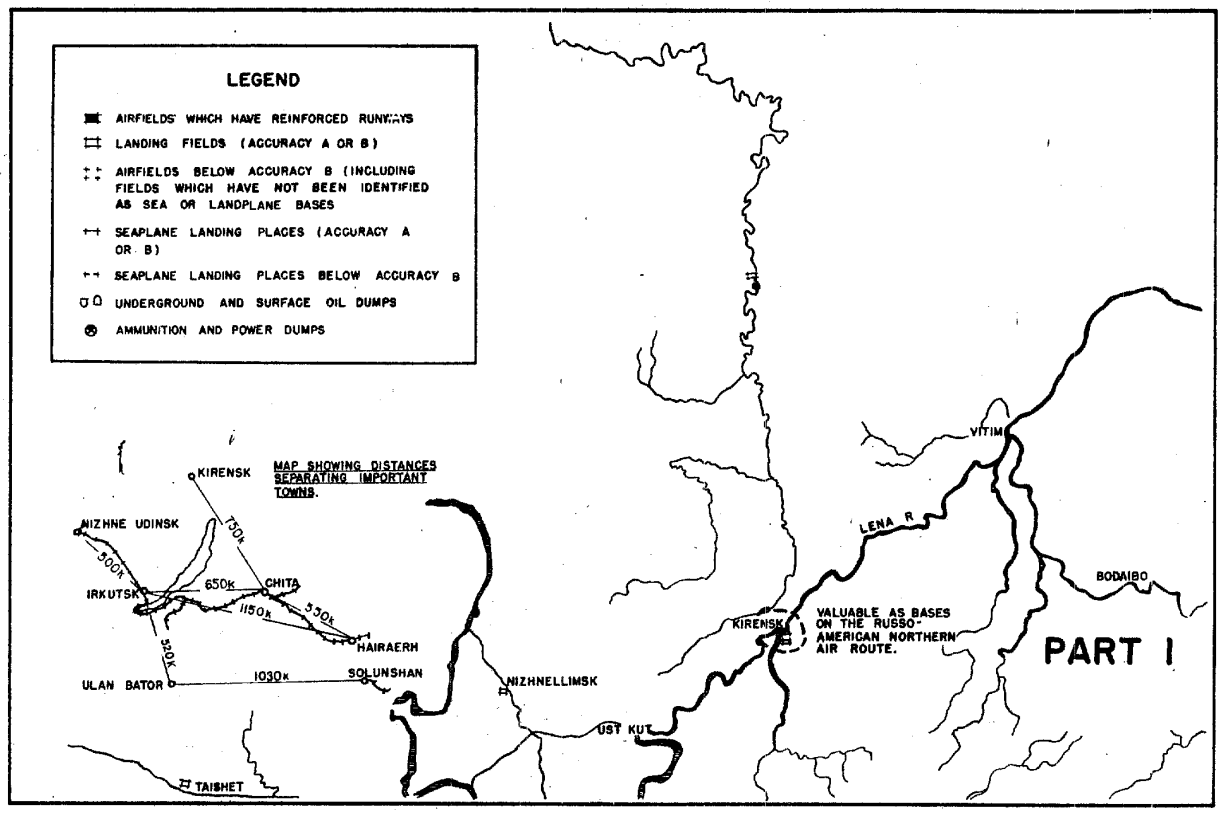
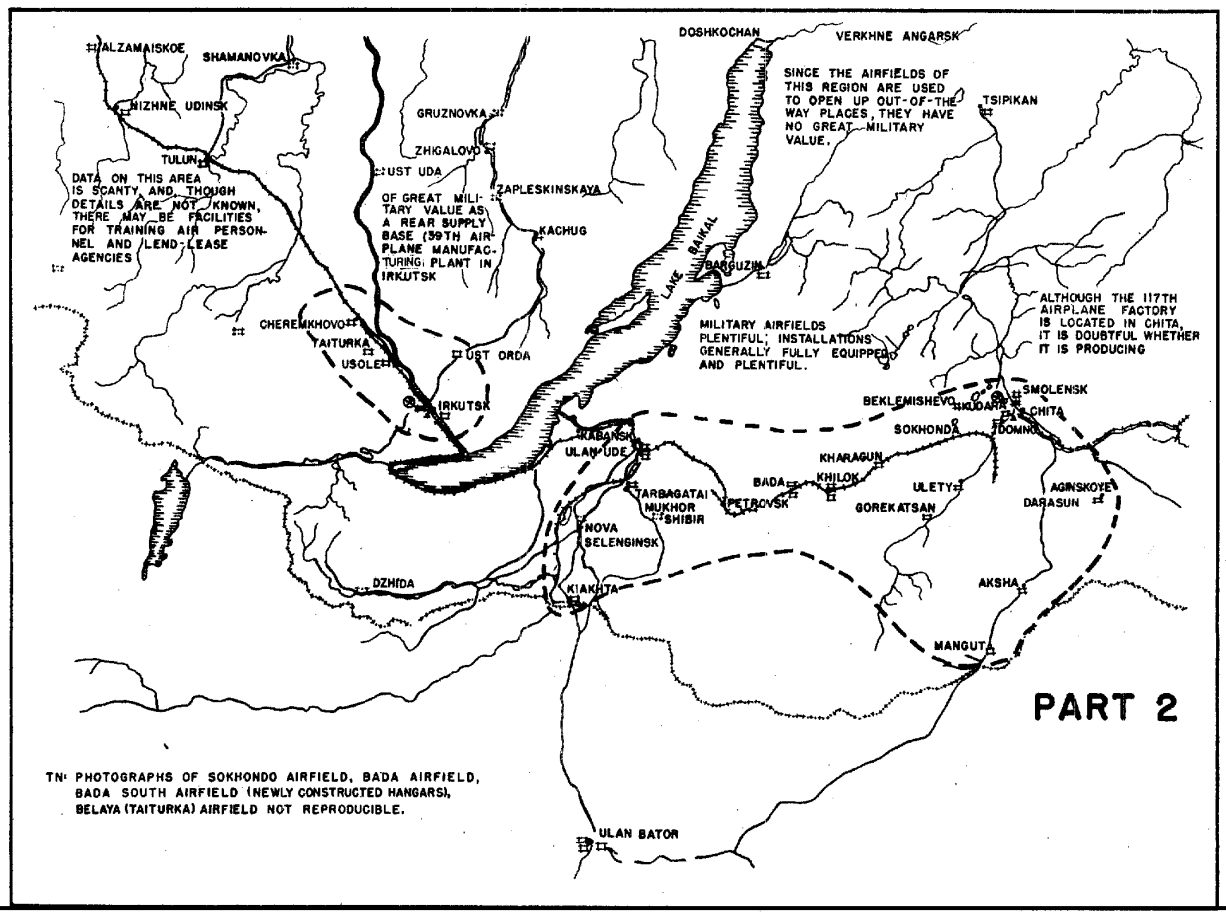
# MAP II. LOCATION OF AIRFIELDS




TN: PHOTOGRAPHS OF SOKHONDO AIRFIELD, BADA AIRFIELD, BADA SOUTH AIRFIELD (NEWLY CONSTRUCTED HANGARS), BELAYA (TAITURKA) AIRFIELD NOT REPRODUCIBLE.

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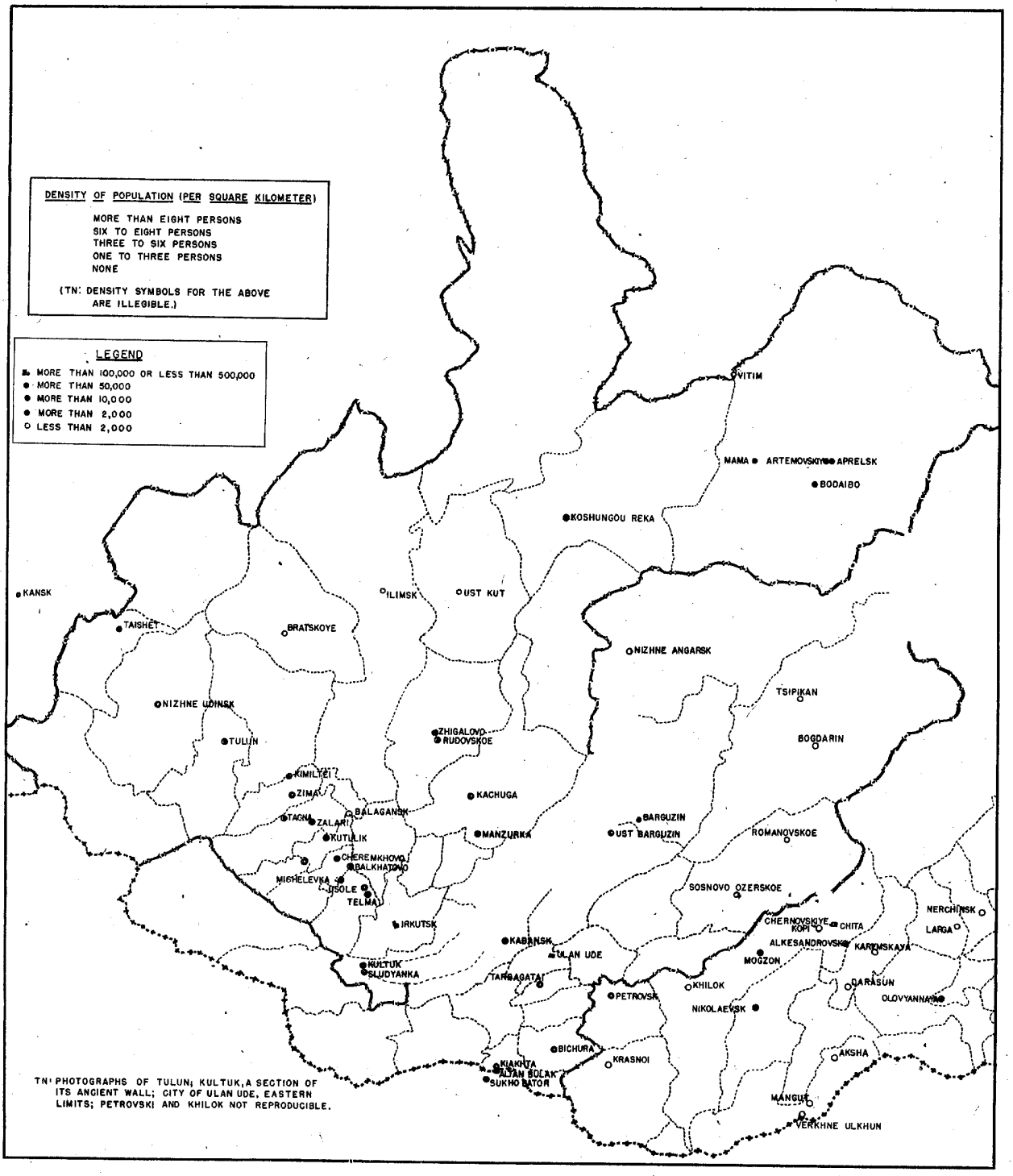
# MAP 12

## DISTRIBUTION OF POPULATION AND PRINCIPAL CITIES AND TOWNS

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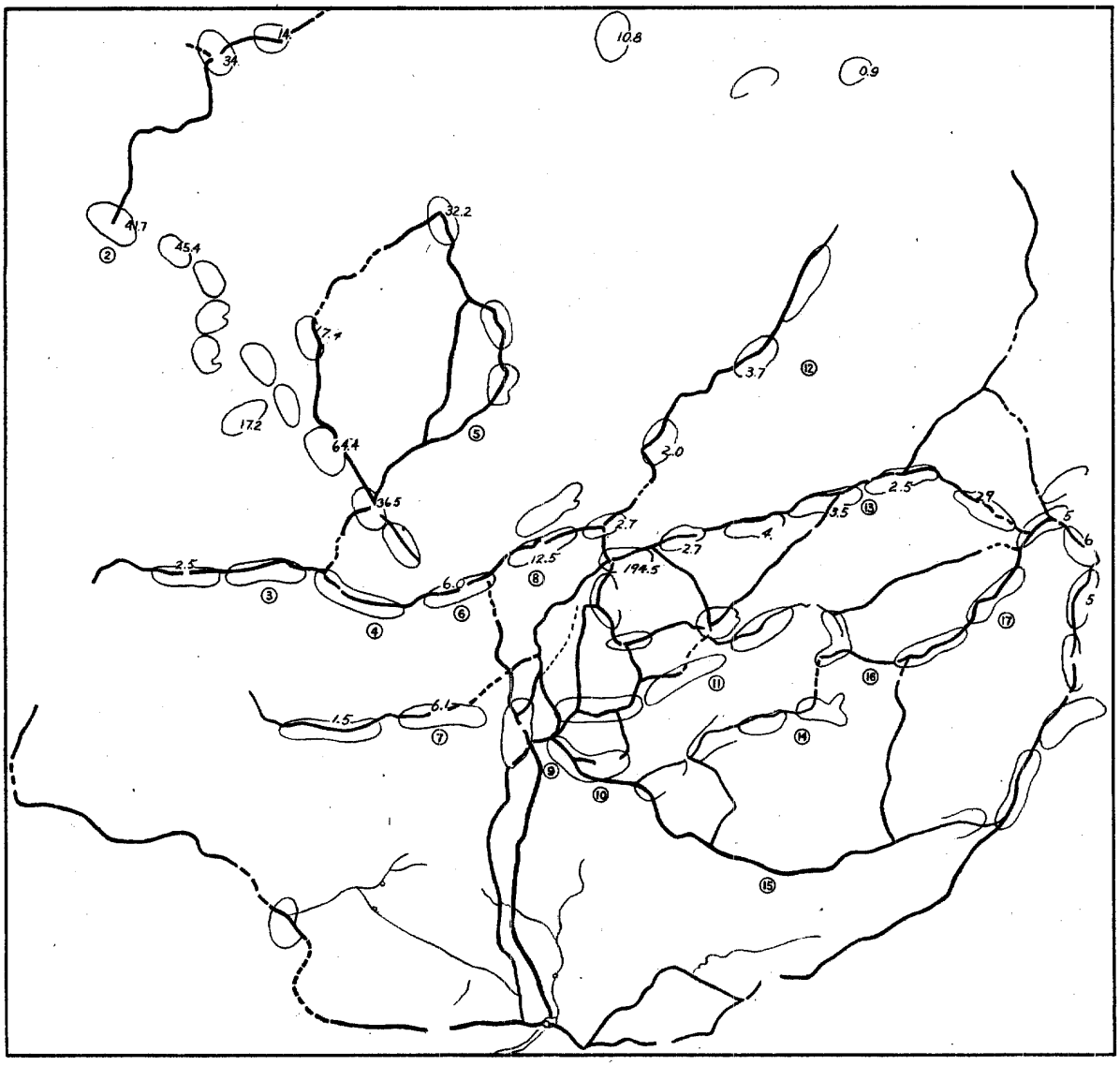
# MAP 13. BILLETING FACILITIES AND WATER SUPPLY




## LEGEND

BILLETING CAPACITY
(NUMBERS INDICATE UNITS OF A THOUSAND)
EXAMPLES:
0.6 INDICATES 600 PEOPLE
15.0 " 15,000 "

——WATER SUPPLY AVAILABLE

– – –IN THIS SECTION, EITHER WELLS OR THE TRANSPORTING OF WATER FROM OTHER AREAS IS NECESSARY.

NUMBERS IN CIRCLES REFER TO THE KEY

NOTE: (i) POPULATION IS CALCULATED AT FROM THREE TO FIVE TIMES THE NUMBER OF HOUSES, AND THE BILLETING CAPACITY IS 1.5 TIMES THE POPULATION.

(ii) THE WATER SUPPLY IS SUFFICIENT FOR 20,000 PEOPLE AND 10,000 HORSES.

Map 13. BILLETING FACILITIES AND WATER SUPPLY

## I. SUMMARY

Inhabited areas are generally concentrated about railway lines and principal-river regions. In other areas and Outer Mongolia, the population is exceedingly sparse, and, since, with the exception of the abovementioned areas, billeting facilities are inadequate, the encampment of troops is entirely dependent upon tent camps.

Usually there is no difficulty in maintaining a water supply, not only because these areas, which are almost completely encircled by mountains and plateaus, abound in rivers and streams and are dotted here and there by springs and marshes, but also because inhabited areas and communication routes grew up along the banks of the principal rivers and use well and river water.

Key to Map 13

Part 2:

1. Legend

(See map)

2. Towns Along the Railroad West of Irkutsk

Principal towns of this area are situated close together, and river and well water is used. There is probably little difficulty in obtaining water supplies, but little information is available.

3. Khangin-Kultuk-Irkutsk

Water is obtained mainly from the rivers, that of the Irkut River apparently being good.

4. Jida River Valley

River and well water is used. Good water is also obtainable from wells dug to a depth of 5-10 meters.

5. Between Ulan Ude and Kultuk

Water is obtained mainly from the rivers and Lake Baikal. In Kabansk and Lysovsk, however, there is an abundance of wells, and water is easily obtained.

6. Between Ust Kyakhta and Lysovsk

Drinking water is comparatively easy to obtain from neighboring rivers and wells of the towns and villages.

7. Between Ulan Bator and Altan Bulak

Water may be obtained easily from rivers, springs, and some wells. The river water is good, and that of small ponds, though muddy, is drinkable.

8. Between Kyakhta and Ulan Ude

Water is obtained from wells and rivers.

9. Between Kyakhta, Tarbagatay and Ulan Ude

Water is mainly obtained from wells. (TN: rest illegible)

10. Between Mal Kudara, Bichura and Ulan Ude

Water is obtained mainly from wells, but may also be easily obtained from the rivers.

11. Petrovsk-Bichura

Water is obtained mainly from the rivers, but there are many wells in the villages.

12. Between Chita, Sasnovozerskoe and Ulan Ude

There are a few wells in the villages, but the inhabitants usually use river water. Water is also obtained from springs in the (TN: illegible) area and lakes in the Sasnovozerskoe area.

13. Along the Railroad

Water is obtained from rivers and wells.

14. Between Bukukun, Menza and Kyakhta

Water is obtained mainly from the rivers.

15. Between Verkhne Ulkun, Lamain Khure and Ulan Bator

Water may usually be obtained easily from the rivers.

16. Tanga-Bukukun

Water may be obtained only from the rivers.

17. Between Chita, Nikolaevsk and Krasnoe

Along the road, both wells and rivers supply water, and in the villages are many wells.

Map 14. STORAGE INSTALLATIONS FOR PROVISIONS (Irkutsk Oblast)

I. SUMMARY

In spite of attempts to increase the grain-harvest sowing area in this region, because of bad weather, the wartime grain output did not exceed 500,000 tons, nor the fodder output, 250,000 tons. But in certain other areas (Nos), because of an increase in supply, not only was the demand of these areas able to be met, but, in Chita and the eastern regions, there was even some export.

With regard to the storage of accumulated munitions, the Chita area, as supply base for the Transbaikal army administrative area, and Irkutsk, as the supply base for the eastern Siberia army administrative area, have expanding storage facilities.

As supply base for Outer Mongolia, Ulan Ude must have extensive storage facilities. Judging from the above, liquid fuel supplies are reckoned at about 70,000 tons, provisions and fodder at about 130,000 tons, and munitions at about 90,000 tons. (Besides this, there are 329 storehouses.)

Key to Map 14

Part 1:

| | Crops | Amount |
|---|---|---|
| 1. | Potatoes | 330,000 Tons |
| | Vegetables | 47,000 Tons |

| | Livestock | No Head |
|---|---|---|
| 2. | Cattle | 401,000 |
| | Sheep & Goats | 325,000 |
| | Hogs | 130,000 |
| | Total | 856,000 |

Part 2:

| | Type Factory | Max Production Per Yr |
|---|---|---|
| 3. | Milling | 11,500 Tons |

| | Type Factory | Max Production Per Yr |
|---|---|---|
| 4. | Salt | 20,000 Tons |

5. Between Kharik and Tulun are the following:

| | | |
|---|---|---|
| 1. Shuba | Fuel (liquid) and munitions store | |
| 2. Azei | " " " food | " |
| 3. Sheragul | Food store | |
| 4. Shingatun | " " | Exact location not known |
| 5. Kuitun | " " | |

6.

| Type Factory | Max Production Per Yr |
|---|---|
| Milling | 16,500 Tons |

7. Food store in Harurun

8.

| Type Factory | Max Production Per Yr |
|---|---|
| Milling Combine | 30,000 Tons |
| Buryat-Mongolia Cooperative Mill | 30,000 Tons |
| Meat Mfg Combine | 15,000 Tons |
| Meat | 4,000 Tons |

9.

| Crops | Max Harvest Per Yr |
|---|---|
| Potatoes | 47,000 Tons |
| Vegetables | 34,000 Tons |

10.

| Livestock | No Head |
|---|---|
| Cattle | 358,000 |
| Sheep & Goats | 483,000 |
| Hogs | 43,000 |
| Total | 884,000 |

11.

| Type Factory | Max Production Per Yr |
|---|---|
| No 2 Milling | 60,000 Tons |
| No 3 Milling | 68,000 Tons |
| Meat | 1,000 Tons |

Key to Map 14 (Contd)

12. Food store in Maguiruski (exact location unknown)

13. Food store in Sayanzui (exact location unknown)

14.

| Type Factory | Max Production Per Yr |
|---|---|
| Milling | 75,000 Tons |
| Meat Combine | 15,000 Tons |
| Macaroni | 3,000 Tons |
| Tea | 2,000 Tons |

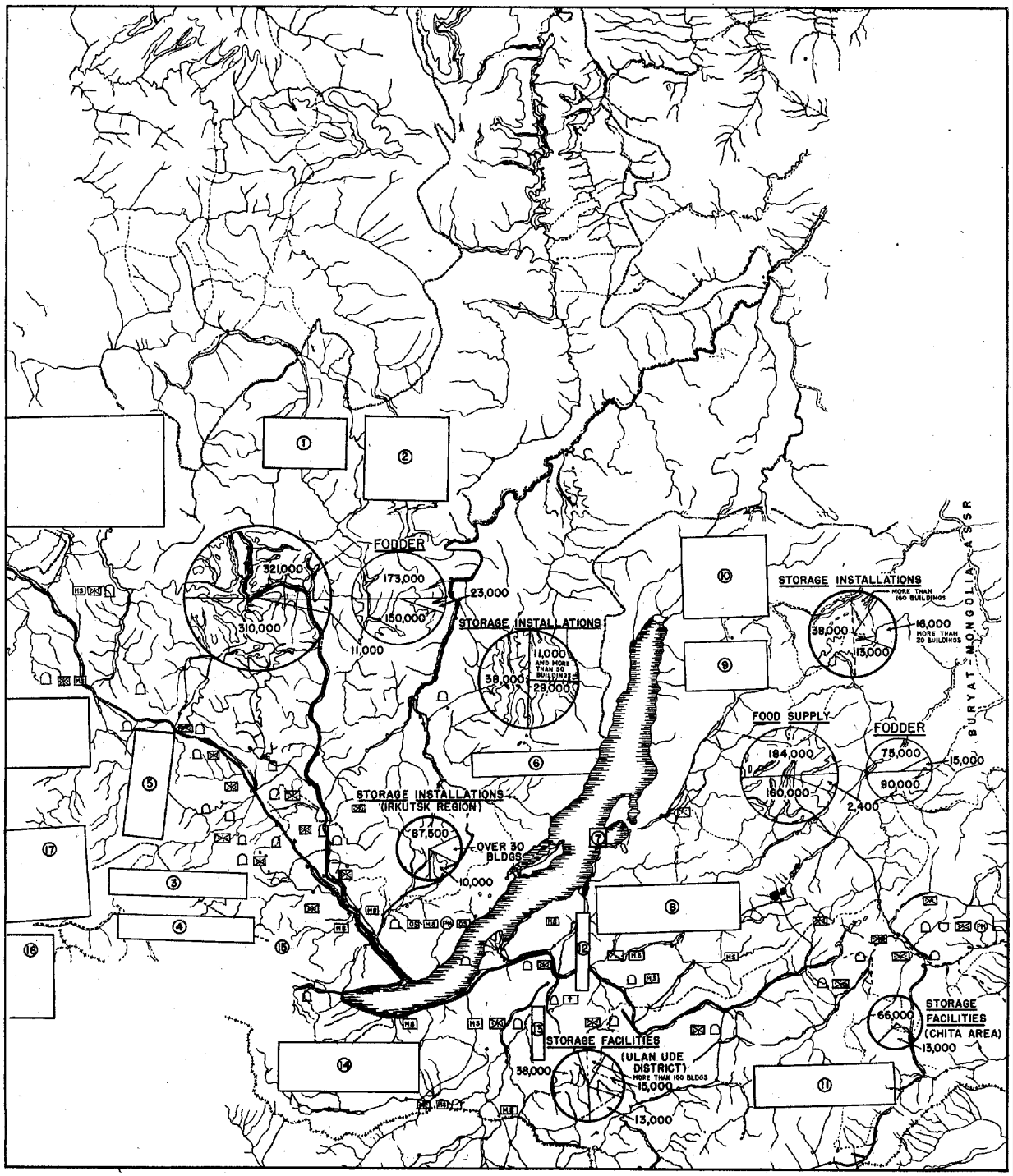
15. Between Irkutsk and Batarey:

19 military storehouses
24 food (fodder) stores
Exact location unknown

16. Food store in Cheremkhovo

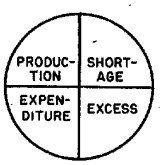
17. Oil tanks in Beraya (Photograph not reproducible)

# MAP 14. STORAGE INSTALLATIONS FOR PROVISIONS (IRKUTSK OBLAST)

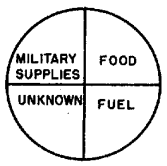



## LEGEND

- 3 INDICATES NUMBER OF ARMY STOREHOUSES
- ? UNIDENTIFIED STOREHOUSE
- MS MUNITIONS STORE
- OS ORDNANCE STORE
- FOOD STORE
- SUBTERRANEAN STORE
- SURFACE STORE
- PM POWDER MAGAZINE
- (2) NUMBERS IN CIRCLES REFER TO KEY




NOTE: FIGURES INSIDE DIAGRAMS INDICATE PRODUCTION, EXPENDITURE, SHORTAGES, AND EXESSES OF EACH PROVINCE. (TN: UNLESS OTHERWISE INDICATED. FIGURES ARE IN TONS.)




NOTE: FIGURES INSIDE DIAGRAMS INDICATE THE AMOUNT STORED IN EACH AREA.

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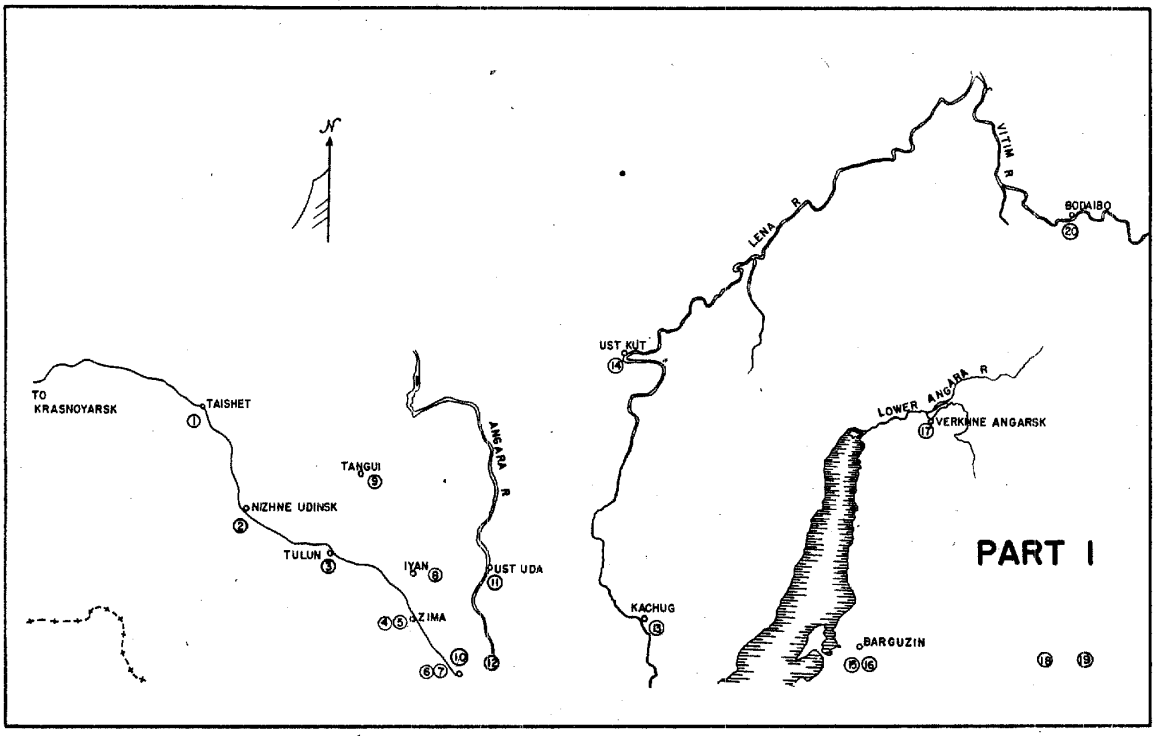
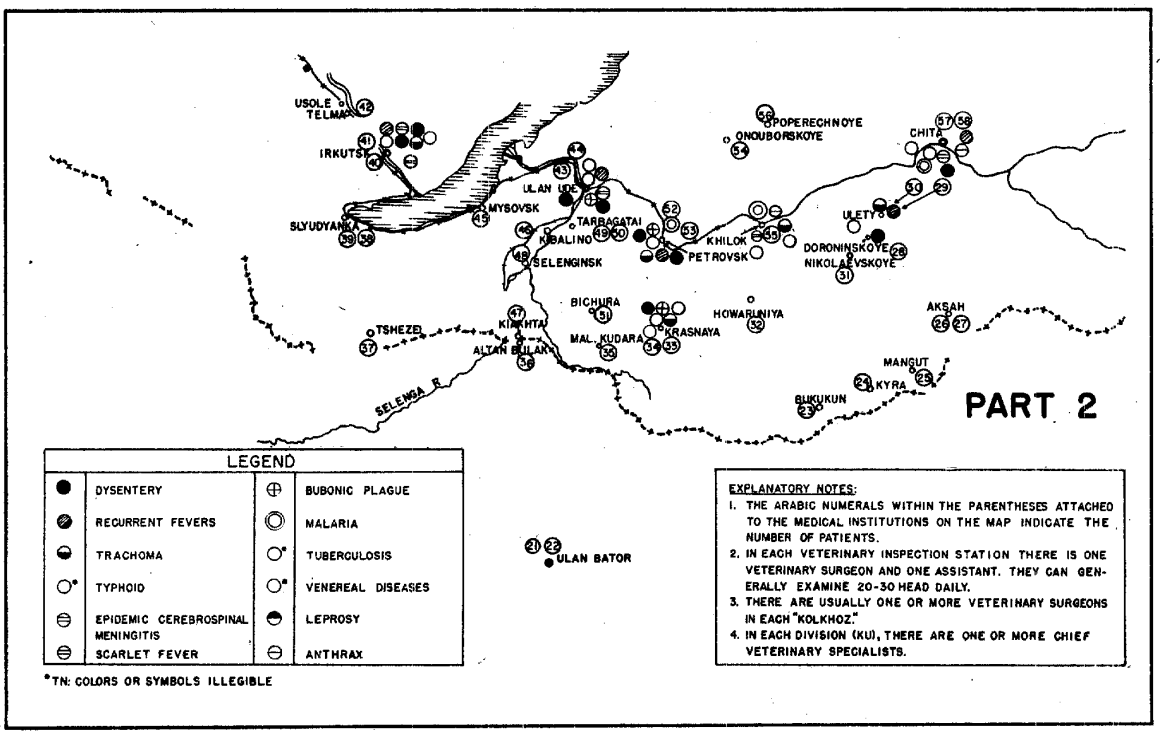
# MAP. 15 HYGIENE (MEN AND ANIMALS)




| LEGEND | | | |
|---|---|---|---|
| ● | DYSENTERY | ⊕ | BUBONIC PLAGUE |
| ◍ | RECURRENT FEVERS | ◎ | MALARIA |
| ◒ | TRACHOMA | ○* | TUBERCULOSIS |
| ○* | TYPHOID | ○* | VENEREAL DISEASES |
| ⊖ | EPIDEMIC CEREBROSPINAL MENINGITIS | ◓ | LEPROSY |
| ⊖ | SCARLET FEVER | ⊖ | ANTHRAX |

*TN: COLORS OR SYMBOLS ILLEGIBLE

21 22 ULAN BATOR

EXPLANATORY NOTES:

1. THE ARABIC NUMERALS WITHIN THE PARENTHESES ATTACHED TO THE MEDICAL INSTITUTIONS ON THE MAP INDICATE THE NUMBER OF PATIENTS.
2. IN EACH VETERINARY INSPECTION STATION THERE IS ONE VETERINARY SURGEON AND ONE ASSISTANT. THEY CAN GENERALLY EXAMINE 20-30 HEAD DAILY.
3. THERE ARE USUALLY ONE OR MORE VETERINARY SURGEONS IN EACH "KOLKHOZ."
4. IN EACH DIVISION (KU), THERE ARE ONE OR MORE CHIEF VETERINARY SPECIALISTS.

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Key to May 15

HYGIENE (MEN AND ANIMALS)

Part 1:

1. Skin and venereal disease research institute
   Hospitals (5); 1 isolation hospital
   Capacity small

2. Kamshut Village camphor and turbine oil factory
   Oil supply base (capacity, 1,000 tons)

3. Veterinary hospital (10,000)
   Tulun stud farm
   Tulun No 2 and 4 hemp factories

4. Veterinary clinic

5. Army hospital

6. Veterinary clinic

7. Arsenic factory
   Soda factory

8. Veterinary hospital

9. Veterinary hospital (10,000)

10. Veterinary college (1,000 students)

11. Veterinary hospital

12. Hydrogen and caustic soda factory
    Alcohol factory
    Chemical factory
    Eastern Siberia Salt Mfg Trust

13. Veterinary hospital

14. Veterinary clinic

15. Veterinary clinic

16. Maternity hospital
    Sanatorium
    Nursery school

17. Isolation sanatorium
    Northern Baikal hospital
    Infirmary
    Hospital

18. Army hospital (17)
Provincial hospital
Bacteria research institute
Central infirmary
Malaria infirmary
Plague infirmary
General hospital 4 (405)
Gynaecological office (hospital) (60)
Mental hospital (150)
Tuberculosis sanatorium
Bacteria research institute
Venereal disease infirmary
Railway hospital (45)
Free tuberculosis hospital
Lenin hospital
City hospital
Evacuation hospital (18)
Clinic
Maternity hospital
City isolation hospital
Municipal free hospital
Public free hospital
Children's free hospital
Chemical laboratory
Mud-bath-treatment hospital
Disease prevention research institute

19. NOTE: Of the 17 army hospitals: accuracy grade A for 2; grade C for 15. For the 18 evacuation hospitals: grade A for 7; grade B for 5; grade C for 6.

20. Army hospital
Pharmaceutical control bureau

Part 2:

21. Agriculture and livestock dept
Veterinary clinic (2)
Veterinary inspection station (1)
Scientific research institute
Formalin steam disinfecting room
Veterinary pharmacists' assistants' special school
Bacteriological breeding station
Central pharmacy
Army ordnance supply stores HQ
Veterinary school
Slaughterhouse

22. Army hospital
State hospital
Central national hospital
Mental hospital
Children's hospital
Tuberculosis hospital
Bacteriological research institute

22. (Contd)

Out-patients' clinic
Central free hospital for venereal diseases
Medical school
Short-course hygiene school
Short-course chemists' school
Nurses' school

23. Private hospital
Clinic

24. Private hospital
Clinic

25. Clinic

26. Private hospital
Clinic

27. Veterinary clinic

28. State soda factory
Glanker's Salts Store

29. Clinic
Hospital

30. Veterinary clinic

31. Private hospital
Alcohol factory

32. Free tuberculosis hospital
Private hospital

33. Private hospital
Clinic

34. Veterinary clinic

35. Veterinary clinic

36. Veterinary bacteria research institute
State inspection station
Mercuric chloride disinfecting station

37. Pest-control station
Private hospital
Regional hospital
Medical inspection station
Disinfecting station
Nursery school
Maternity hospital

38. Railway hospital (25)
Clinic

39. Livestock import dept

40. Veterinary hospital (10,000)
Veterinary inspection station
State stud farm
Eastern Siberia epidemic-control research institute
Medicinal-plant test station of the Russian Higher pharmaceutical technical school
Higher technical school for toxics and bacteriology
Eastern Siberia horseshoe and rough (spike) stores
Irkutsk

41. Army hospital (15)
Evacuation hospital (14)
City hospital
Private hospital /106/ (4205)
Bacteria research institute
Clinic /108/
Maternity hospital /182/
Provincial general hospital
Leper hospital
Tuberculosis infirmary
Water-works dept health hospital
Water-works dept tuberculosis sanatorium
Public health free hospital
Bacteria research institute
Children's tuberculosis sanatorium
Railway dept free clinic
Central maternity hospital
Lenin Village hospital
Plague-control clinic
School of oralogy
School for army hygiene-instruction officers
Drug manufactory
Soap factory
Yeast factory

42. Alcohol factory

43. Railway hospital
Army hospital
General hospital
Provincial hospital
Private hospital (449)
City hospital
Sanatorium
Clinic
Maternity hospital
Bacterial research institute
Health research institute
Provincial hospital (internal medicine)
Provincial surgical hospital
Provincial Red Cross Committee

43. (Contd)

Medical school
Dental school

44. Veterinary hospital
Stockbreeding medical school
Higher veterinary school
State stud farm

45. Private hospital
Clinic

46. Veterinary clinic

47. Plague-control institute
Private hospital
District hospital
Quarantine station
Decontamination station
Nursery school

48. Private hospital

49. Veterinary clinic

50. Private hospital

51. Private hospital

52. Veterinary hospital

53. Private hospital
Clinic
Maternity hospital
Nursery school

54. Veterinary clinic

55. Private hospital
Clinic

56. Private hospital

57. Veterinary control board
Veterinary bacteriological research institute
Veterinary research institute
Veterinary hospital
Pharmaceutical research institute
State stud farm
Pharmaceutical HQ
Horse medical-supplies dept
Veterinary-supplies dept
Army horse stock farm
Veterinary stores warehouse
Pharmaceutical HQ warehouse

58. Medical school
Obstetrician's school
Drugs manufactory
Serum factory
Sodium chloride factory
Oxygen factory

Key to Map 16

INDUSTRIAL RESOURCES (IRKUTSK OBLAST)

Part 1: See Map

Part 2:

1. [Photograph not reproducible]

A.

| Factory | Production | Unit | Production Capacity | |
|---|---|---|---|---|
| 41st Military Factory | Antitank Guns | Guns | Monthly | 20 |
| | Heavy Machine Guns | Guns | Monthly | 80 |
| | Ball Ammunition | | | |
| 117th Aircraft Repair Plant | Repair and Parts Mfg | | | |

B.

| Factory | Production | Unit | Production Capacity | |
|---|---|---|---|---|
| Metallurgy Works | Tin | Tons | Yearly | 57,000 |
| Land-Mine Factory | Land Mines | | | |
| Ordnance Factory | Field & Mountain Guns | Guns | | 15 |
| | Guns and Mortars | Morts | | 100 |

C.

| Factory | Production | Unit | Production Capacity | |
|---|---|---|---|---|
| Railroad Rolling-Stock Factory | Steel | Tons | Yearly | 4,000 |
| | Heavy Machine Guns | Guns | Monthly | 20 |
| | Light Machine Guns | Guns | Monthly | 60 |
| Buryat-Mongolia Ordnance Factory | Rifles and Sub-Machine Guns | Guns | Monthly | 2,000 |
| | Ammunition | | | |
| 99th Aircraft Factory | LA5 Fighter Planes | | Monthly | 40 |
| Tank Assembly Factory | Tanks and Armored Cars | | | 20 |

D.

| Factory | Production | Unit | Production Capacity | |
|---|---|---|---|---|
| Ordnance Factory | Rifles and Sub-Machine Guns | Guns | Monthly | 1,000 |
| Kuibishev Metals Factory | Steel | Tons | Yearly | 20,000 |
| | Field & Mountain Guns | Guns | Monthly | 15 |
| | Antitank Guns | Guns | Monthly | 20 |
| | Heavy Machine Guns | Guns | Monthly | 30 |
| | Light Machine Guns | Guns | Monthly | 40 |
| | Ammunition | | | |
| 39th Aircraft Factory | IL4 & ER2 Bombers | Plns | Monthly | 80 |
| | Fighter Planes | Plns | Monthly | 50 |
| 125th Aircraft Factory | Operating with 39th Aircraft Factory | | | |
| 77th Aircraft Factory | | | | |

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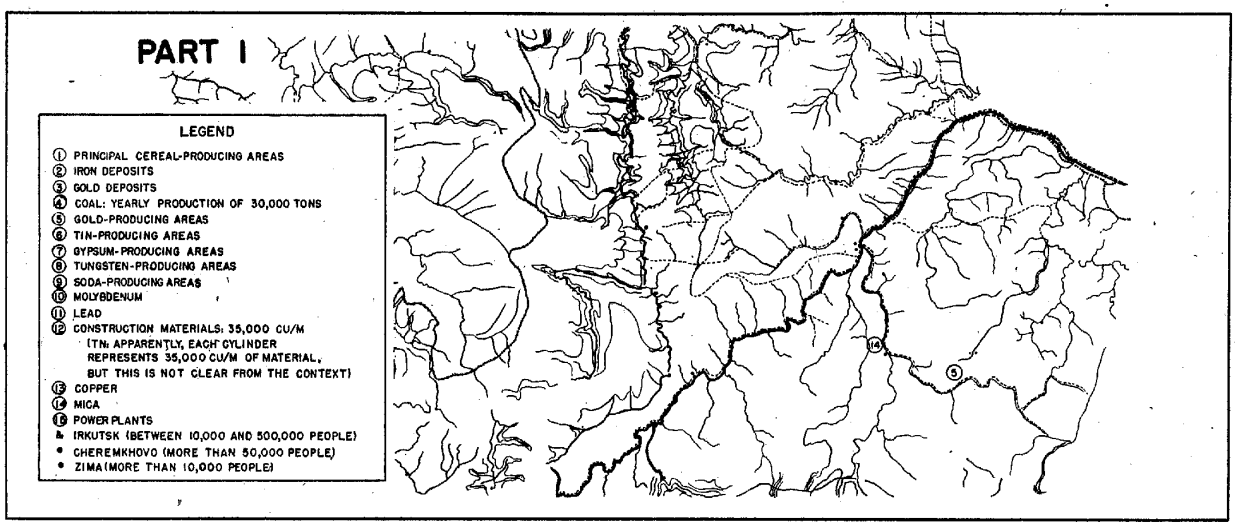
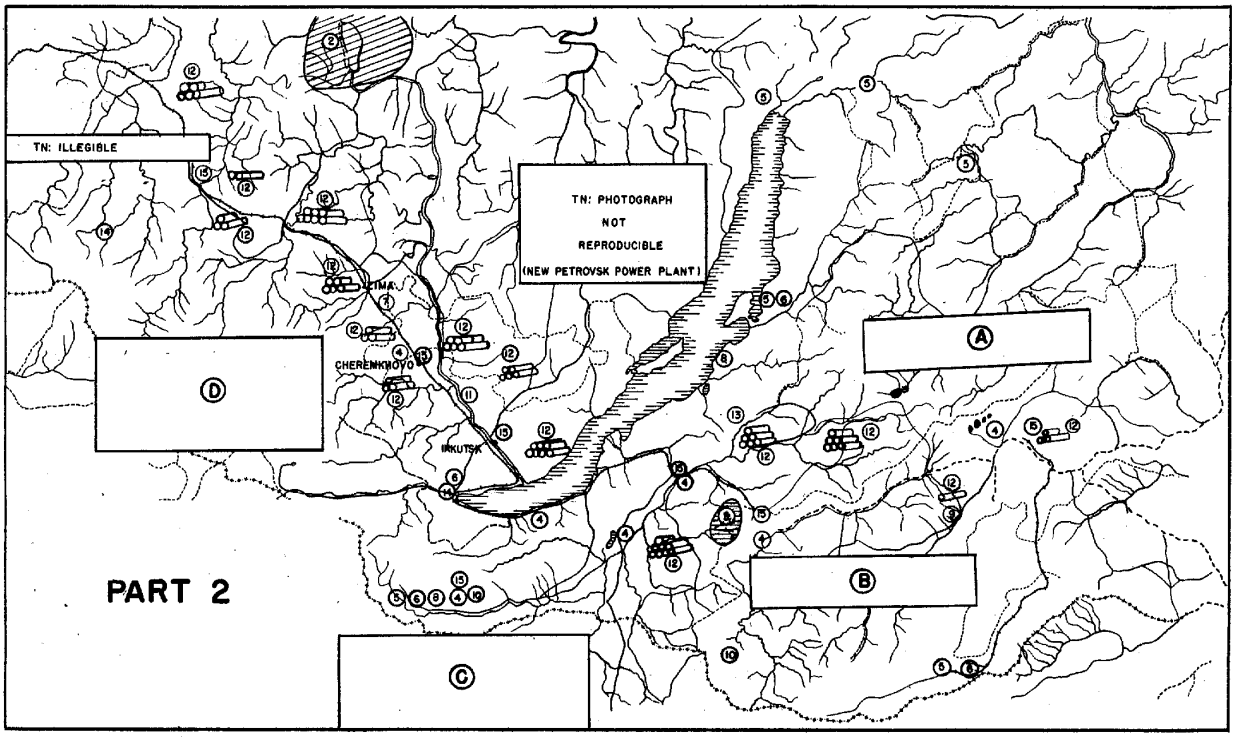
CPYRGHT

# MAP 16

## INDUSTRIAL RESOURCES (IRKUTSK OBLAST)




(TN: FOR PLACE NAMES, REFER TO MAP 9, WHICH IS IDENTICAL TO MAP 16.)

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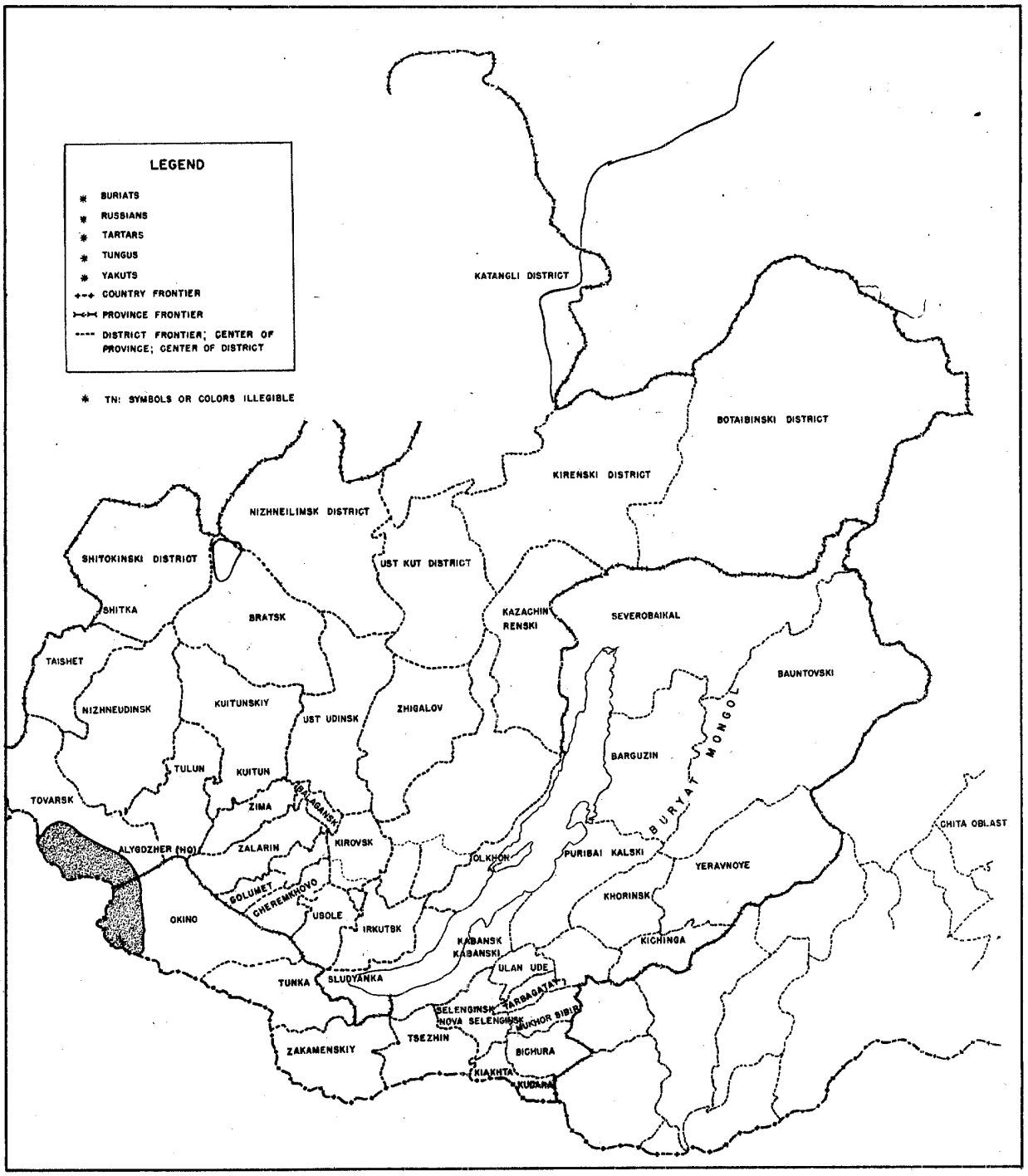
## MAP 17. ADMINISTRATIVE SUBDIVISIONS AND RACIAL DISTRIBUTION



Key to Chart 1

AIR NAVIGATION WEATHER

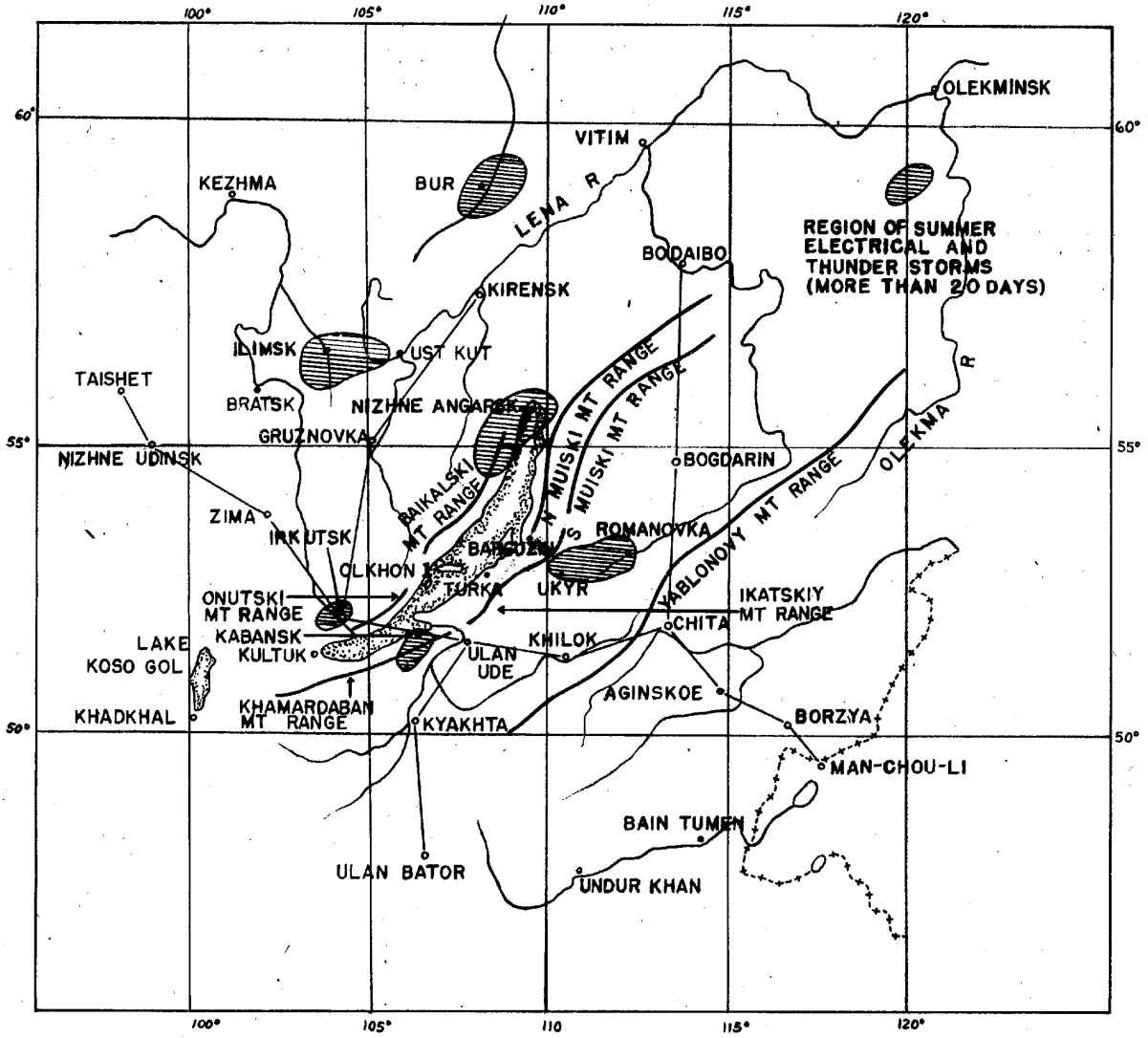
| District | Difficult Months | Time of Low-Lying Clouds | Cloud Height | Rainfall |
|---|---|---|---|---|
| Irkutsk | Jul | Morning | Distributed equally above and below 1,500 m. | |
| | Aug | Morning | Many above 1,500 m. | |
| | Sep | Morning | Distributed equally above and below 1,500 m. | |
| | Jan<br>Dec | | Frequently poor visibility due to fog. | |
| Nizhne Udinsk | May | Evening | Mostly below 1,500 m. | |
| | Aug | Evening | Mostly below 1,500 m. | |
| | Sep | Evening | Mostly below 1,500 m. | |
| | Nov | Morning | Distributed equally above and below 1,500 m. | |
| Bogdarin | Mar | Daytime | Poor visibility due to mist. | |
| | May | 24 hours | Mostly above 1,500 m. | Much (am) |
| | Jun | Morning | Poor visibility due to fog. | |
| | Aug | Morning | Distributed equally above and below 1,500 m. | |
| Bodaibo | Aug | Morning | Mostly below 1,500 m. | |
| | Sep | 24 Hours | Almost all below 1,500 m. | |
| | Oct<br>Dec | Morn & Evg | Poor visibility due to fog. | |
| Kirensk | Aug | Morning | Distributed equally above and below 1,500 m. | |
| | Oct | Daytime | Distributed equally above and below 1,500 m. | Much |
| | Nov | Daytime | Mostly above 1,500 m. | Much |
| | Jan<br>Feb | | Mostly middle clouds. | Much |
| Gruznovka | Jan | | Almost all above 1,500 m. | Much (day) |
| | Apr | Daytime | Distributed equally above and below 1,500 m. | |
| | Jun | 24 Hours | Distributed equally above and below 1,500 m. | |
| | Jul | Night | Distributed equally above and below 1,500 m. | |
| | Sep | Daytime | Distributed equally above and below 1,500 m. | |

Key to Chart 1 (Contd)

| District | Difficult Months | Time of Low-Lying Clouds | Cloud Height | Rainfall |
|---|---|---|---|---|
| Gruznovka (Contd) | Oct | Late Day | Low during day; equally distributed morn & evg. | Much (am) |
| | Nov | Daytime | Many above 1,500 m. | |
| | Dec | Daytime | Mostly above 1,500 m. | |
| Chita | Aug | Morning | Mostly above 1,500 m. | |
| | Feb | | | |
| | Mar | | Vertical visibility | |
| | Dec | | poor due to much mist. | |
| Khilok | Jul | Morning | Mostly below 1,500 m. | |
| | Aug | Morning | Mostly below 600 m. | |
| Ulan Bator | Nov | | | |
| | Dec | | Vertical visibility | |
| | Jan | | poor due to much mist. | |
| | Feb | | | |

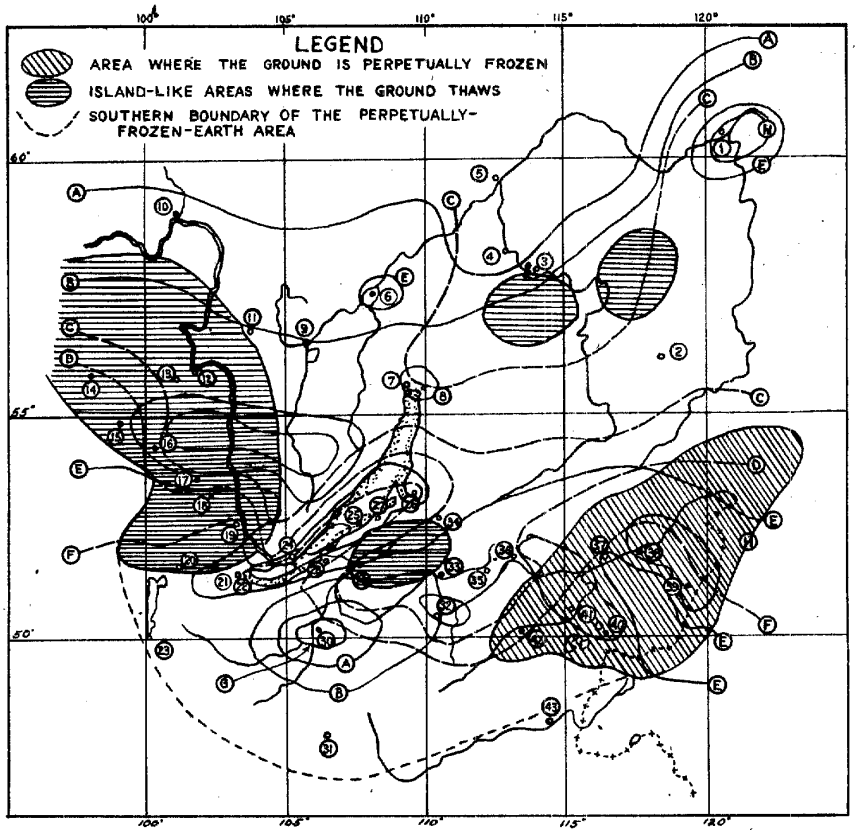
NOTE: In other months, there are few obstacles to air travel.

# CHART 1. AIR NAVIGATION WEATHER



# CHART 2, PART 1

## AVERAGE DATE LIMITS OF 0°-CENTIGRADE TEMPERATURE




**KEY**

- Ⓐ— MID-AUG
- Ⓑ— LATE AUG
- Ⓒ-- MID-JUNE
- Ⓓ-- EARLY JUNE
- Ⓔ— EARLY SEP
- Ⓕ-- LATE MAY
- Ⓖ— EARLY AUG
- Ⓗ— MID-SEP

**LEGEND**

NOTES: (i) THE FREEZING OF A SHALLOW LAYER OF EARTH FOLLOWS THE DROP IN TEMPERATURE TO BELOW 0°C BY ABOUT ONE MONTH.

(ii) GENERALLY THE THAWING OF THIS SHALLOW LAYER OF FROZEN EARTH OCCURS AT THE SAME TIME THAT THE AIR TEMPERATURE GOES ABOVE 0°C.

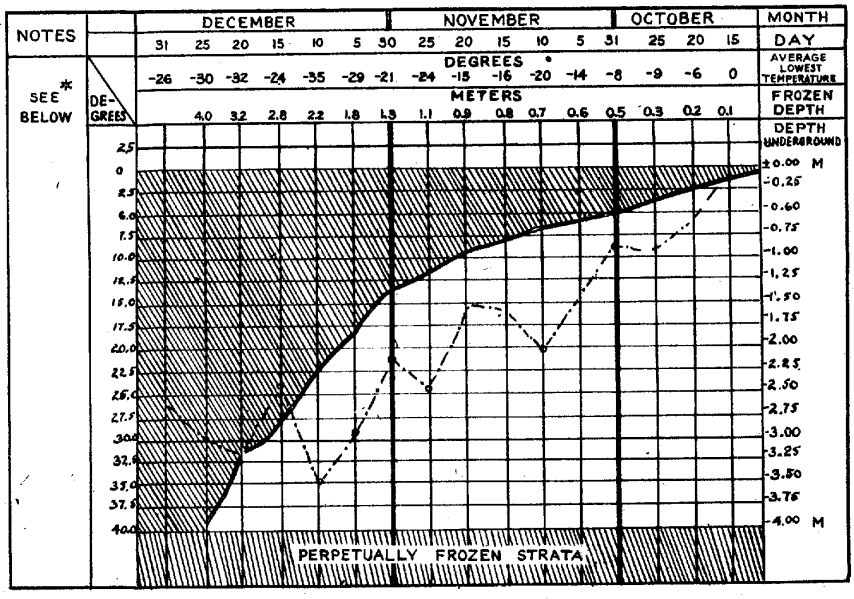
NUMBERS IN CIRCLES REFER TO PLACE NAMES. SEE PAGE 124 FOR KEY.

# CHART 2, PART 2

## DEPTH OF FROZEN EARTH STRATA

### WINTER OF TAISHO, YEAR 7 (1918)

**(TN: PLACE NAME NOT FOUND)**

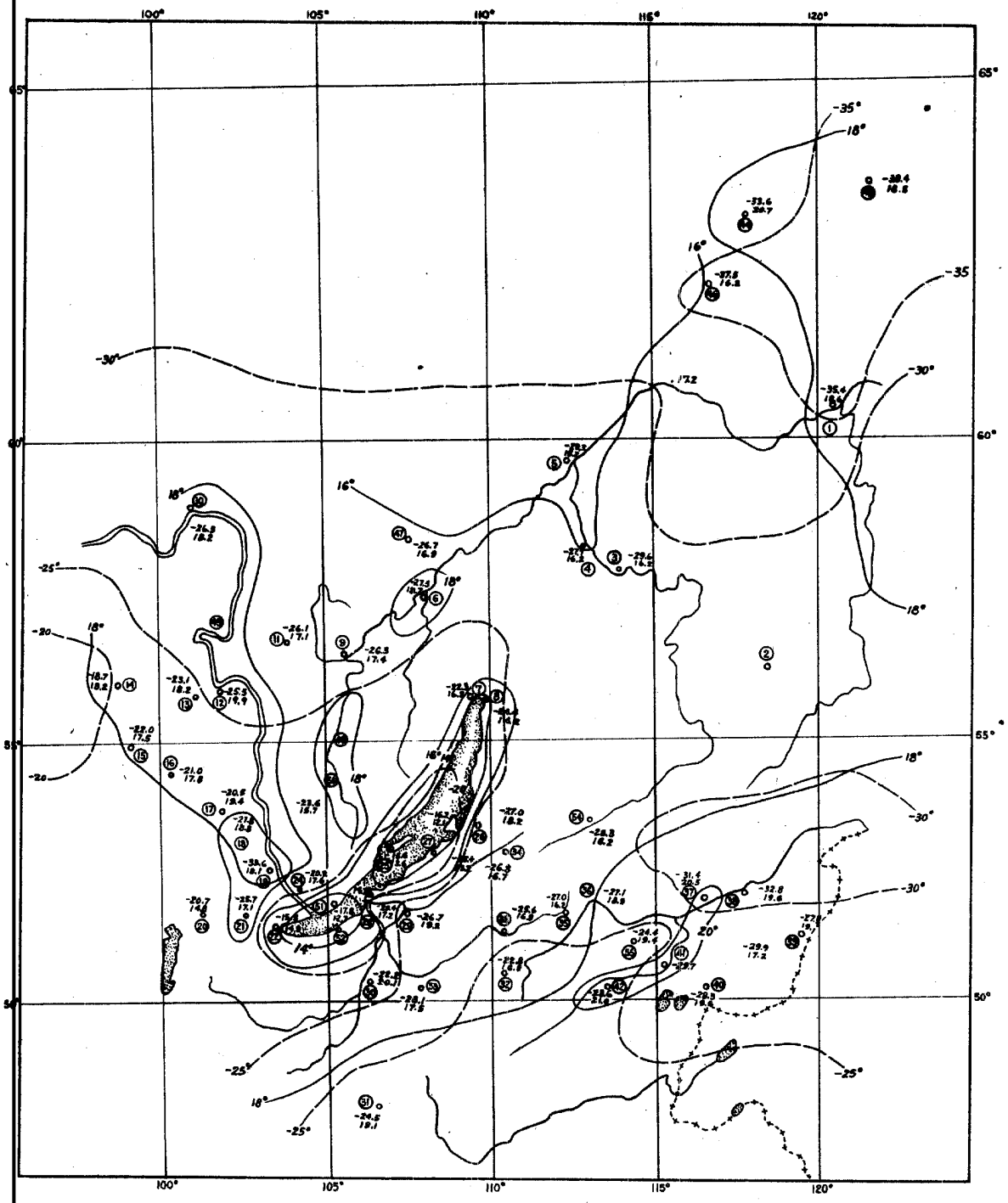



NOTES: (i) THE LINE -·-·-·- INDICATES THE LOWEST TEMPERATURE AND REPRESENTS AN AVERAGE FOR A PERIOD OF 25 DAYS.

(ii) THE SHADED AREA INDICATES THE FROZEN PART.

(iii) "AVERAGE LOWEST TEMPERATURE: -6" MEANS THAT THE TEMPERATURE IS 6° BELOW ZERO.

## CHART 3. AVERAGE TEMPERATURES (JANUARY AND JULY)




### LEGEND

BROKEN LINES DENOTE WINTER (JANUARY) TEMPERATURES.

SOLID LINES DENOTE SUMMER (JULY) TEMPERATURES.

NUMBERS IN CIRCLES REFER TO PLACE NAMES. SEE PAGE 124 FOR KEY.

MASTER KEY TO PLACE NAMES

1. Olekminsk
2. Dikyinskoye
3. Bodaibo
4. Mama
5. Vitim
6. Kirensk
7. Dushkachan
8. Dagary
9. Ust Kut
10. Kezhma
11. Ilimsk
12. Bratskoye
13. Niklayevski Zavod
14. Taishet
15. Nizhne Udinsk
16. Tulun
17. Zima
18. Zalari
19. Usole
20. Mondy
21. Tunka
22. Kultuk
23. Khadkhal
24. Irkutsk
25. Olkhon Island
26. Barguzin
27. Turka
28. Kabansk
29. Ulan Ude
30. Kyakhta
31. Ulan Bator
32. Yamarovka
33. Khilok
34. Ukyr
35. Mogzon
36. Chita
37. Nerchinsk
38. Sretensk
39. Nerchinski Zavod
40. Borzya
41. Olovyannaya
42. Aksha
43. Bain Tumen

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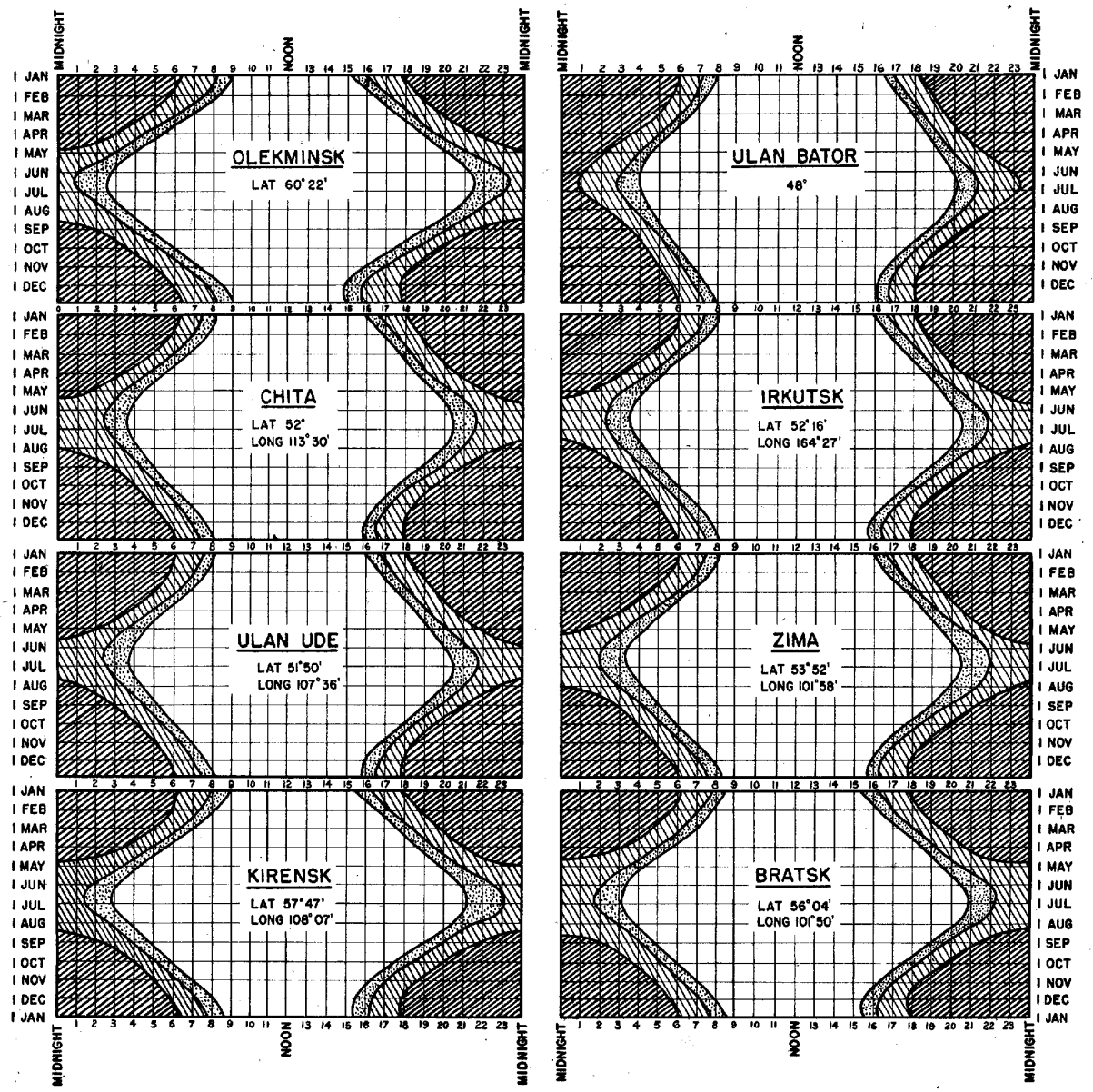
# CHART 4. DAY AND NIGHT




LEGEND

DAY

NIGHT

ASTRONOMICAL TWILIGHT (ANGLE OF DEPRESSION OF THE SUN'S CENTER LESS THAN 18°)

TWILIGHT FOR PRESENT USE (ANGLE OF DEPRESSION OF THE SUN'S CENTER LESS THAN 6°)

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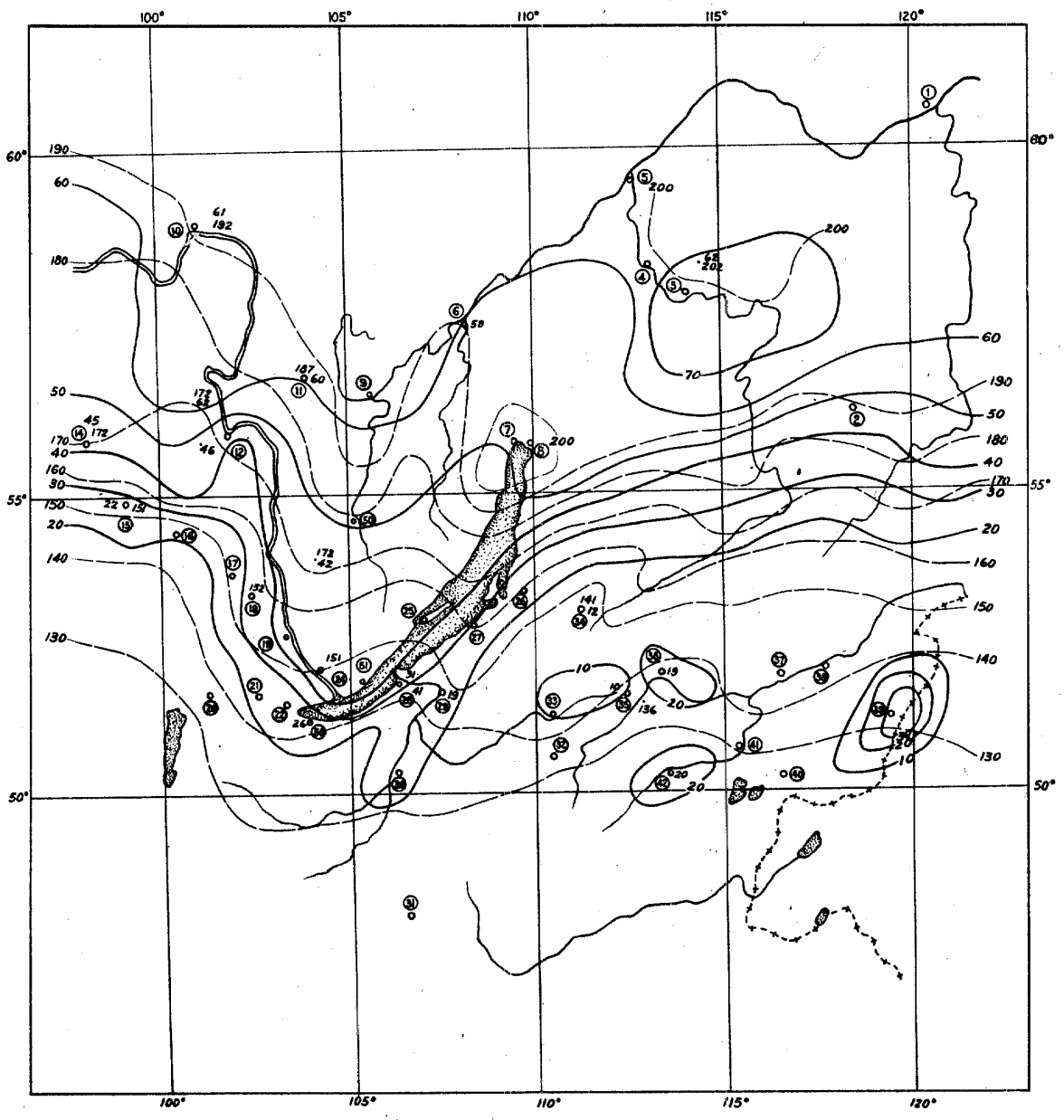
CHART 5.

MAXIMUM SNOW DEPTH AND NUMBER OF DAYS OF CONTINUOUS SNOW



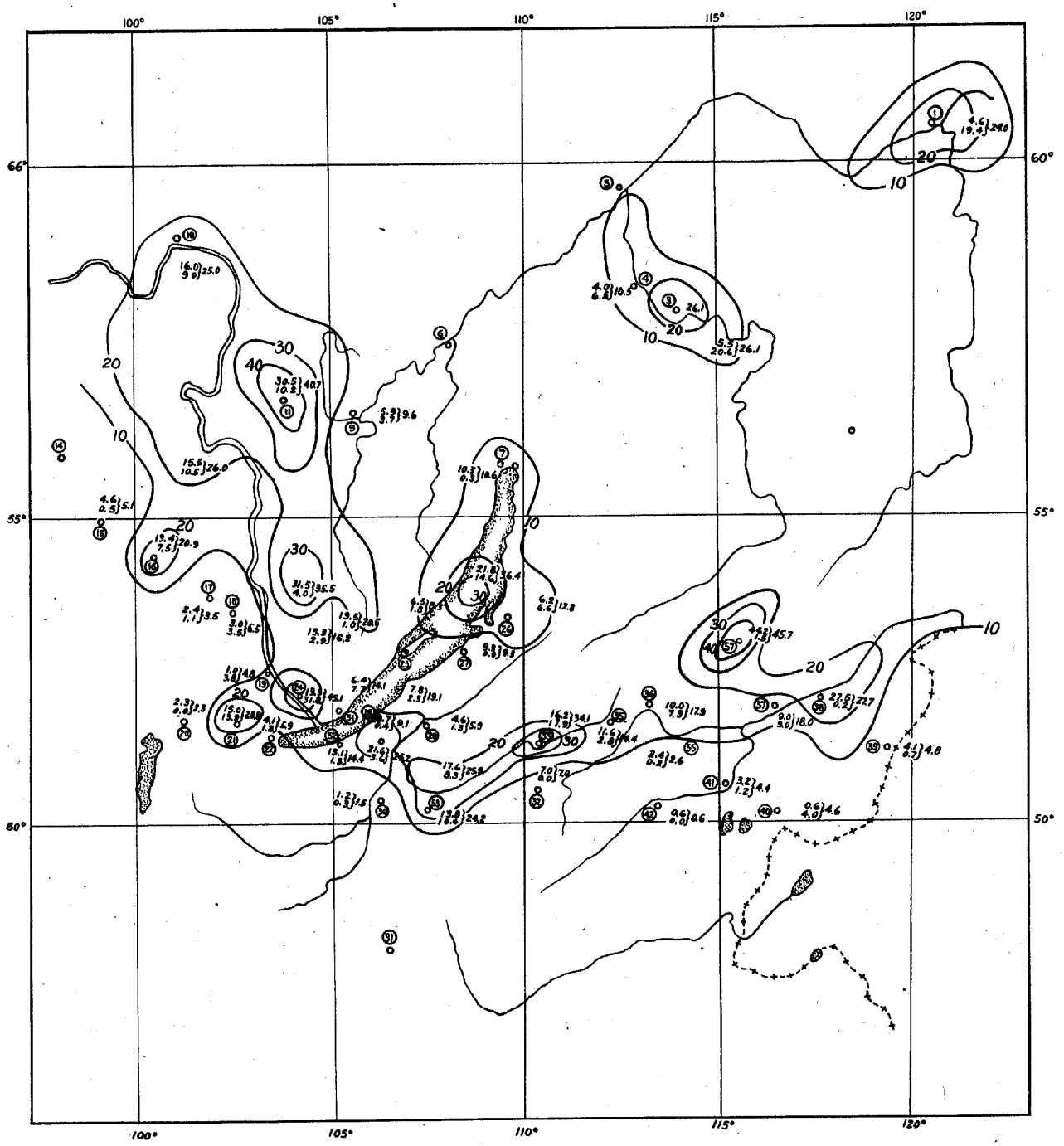

## LEGEND

SOLID LINES DENOTE MAXIMUM SNOW DEPTH.

BROKEN LINES DENOTE NUMBER OF DAYS OF CONTINUOUS SNOW.

NUMBERS IN CIRCLES REFER TO PLACE NAMES. SEE PAGE 124 FOR KEY.

# CHART 6. NUMBER OF FOGGY DAYS




## LEGEND

1. UPPER FIGURES OF EACH PAIR DENOTE DAYS OF FOG WHICH OCCUR IN WINTER (OCT TO APR), AND LOWER FIGURES DENOTE NUMBER OF FOGGY DAYS IN SUMMER.

2. OTHER-DAY LINES ARE DRAWN TO SHOW APPROXIMATE NUMBER OF FOGGY DAYS IN WHOLE YEAR FOR GENERAL AREA.

3. NUMBERS IN CIRCLES REFER TO PLACE NAMES. SEE PAGE 124 FOR KEY.

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